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INDUSTRIAL DEVELOPMENT AND SOUTH-SOUTH COOPERATION*

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TABLE OF CONTENTS

	Page
Table of Contents	i
List of Tables	ii
Introduction	1
A. Industrial Development: The Recent Experience	2
Summary	18
B. Criteria for Identifying Potential for South-South Trade and Industrial Development	20
Summary	27
C. Capital Goods Industries: The Primary Focus for South-South Co-operation and for Industrialization of the South during the 1980s	
1. General Rationale for Capital Goods as the Focus for Industrial Development and South-South Co-operation during the 1980s	29
a) Static Efficiency	31
b) Dynamic Efficiency	33
c) Appropriate Technology	36
2. Obstacles to the Development of Capital Goods Industries in the South	41
3. Potential for Development of Capital Goods Industries	46
Summary	76
D. Industrial Development of the South via South-South Cooperation in Industries other than Capital Goods	79
Summary	101
E. Conclusions and Suggestions for Future Research	103
References	107

LIST OF TABLES

		Page
A.1.	The Share of the South in World Manufacturing Value Added of Different Sectors of Manufacturing.	4
A.2.	Regional Distribution: Share of Each Region in Manufacturing Value Added of the South by Sector and Year. (in per cent) ...	4
A.3.	Growth Rates of Value Added by Manufacturing Sector and by Region 1970-77.	6
A.4.	Structural Change: Composition of Manufacturing Value Added by Region and Sector. (in per cent)	7
A.5.	Employment per Unit of Value Added: by Region and Sector. (The unit of value added is one million US$ at 1975 prices.) ..	8
A.6.	Employment in the Manufacturing Sectors: by Region.	10
A.7.	Shares of Sectoral Employment in Total Manufacturing Employment. (in per cent)	11
A.8.	Gross Production and Apparent Consumption at 1975 Prices and Shares of Gross Production in Apparent Consumption by Sector and Region.	12
A.9.	Matrices of Trade Flows for 1970, 1975 and 1977 by Manufacturing Sectors. (In Million of U.S. Dollars at 1975 Prices.)	16
A.10.	Growth Rates of Trade Flows (in Real Terms) of Manufacturing Sectors by North and South. (in per cent) 1970-1977	17
B.1.	Criteria for Potential Development via South-South Trade and Co-operation.	25
C.1.	Trade in Capital Goods and Total Trade of the North and the South: 1963, 1967, 1970, 1975, and 1978. (In million of U.S. Dollars at Current Prices.)	47
C.2.	Yeats' Measure of Potential South-South Trade in Capital Goods Based on 1975 Prices. (In Millions of U.S. Dollards.)	49
C.3.	Value Added of Capital Goods and Subsectors thereof by Region and Year. (In millions of U.S. Dollars of 1975 Prices.)	52
C.4.	Growth Rates of Real Value Added of Capital Goods Industries by Region of the South and the World.	54
C.5.	Two-by-Two Trade Matrices at Current Prices for Subsectors of Capital Goods for 1970, 1975 and 1977.	55

C.6. Two-by-Two Trade Matrices for Capital Goods and Subsectors Thereof for 1970 and 1977 at Prices of 1975. 56
C.7. Growth Rates of Real Exports of Capital Goods and Subsectors Thereof of the North, the South and the World for the Period 1970-77. 58
C.8. Shares of the South in World Value Added, Exports and Imports of Capital Goods and Subsectors thereof. (in per cent) 59
C.9. Shares of the Different Regions of Developing Countries in the Value Added and Exports of Capital Goods and Subsectors thereof of the South as a Whole. (in per cent) 62
C.10. Value and Growth of Exports of Capital Goods from Developing Countries 1970, 1975, and 1980. 64
C.11. Exports of Capital Goods by Selected Southern Exporters by type and by Destination. (millions of US Dollars f.o.b.) 65
C.12. Export Values Shares and Growth Rates for Developing Countries and Territories by Type of Capital Goods. 66
C.13. Average Annual Growth Rates of Capital Goods by Type and Region of Origin and Destinatin in Constant Prices of 1975 for the Period 1970-1977. 68
C.14. Shares of Value Added in Capital Goods and Subsectors Thereof in Value Added of Total Manufacturing by Region and Year. (Based on Data in Prices and Exchange Rate of 1975.) 72
C.15. Share of Employment in Capital Goods in Total Manufacturing Employment by Region and Year. 74
C.16. Share of Production in Apparent Consumption by Type of Capital Goods and Year 1970, 1975, and 1977. 75
D.1. Gross Production, Imports, Exports, Apparent Consumption and the Share of Production in Apparent Consumption for the Years 1970, 1975, and 1977. 80
D.2. Share of Production in Apparent Consumption for the Years 1970, 1975 and 1977, by Region of the South. 81
D.3. Value Added at Constant Prices of 1975 by Sector and Selected Years between 1963 and 1979. 83
D.4. Growth Rates of Manufacturing Value Added by Sector at Constant Prices 1963-1979. 85

D.5. Employment per Unit of Value Added by Sector 1963, 1970, and 1979 by Region. 86
D.6. Share of Manufacturing Value Added by Region and Sector 1963, 1970 and 1979. 88
D.7. Trade Matrices by Sector and Year 1970, 1975, and 1977. (In Millions of U.S. Dollars of 1975.) 90
D.8. Growth Rates of Intra and Interregional Trade Flows at Constant Prices of 1975 between 1970 and 1977. (In per cent per annum.) 91
D.9a. Trade Shares for Sector 341 Paper and Products. 94
D.9b. Trade Shares for Sector 351 Industries Chemicals. 95
D.9c. Trade Shares for Sector 352 Other Chemicals. 96
D.9d. Trade Shares for Sector 362 Glass. 97
D.9e. Trade Shares for Sector 369 Non-metallic Minerals. 98
D.9f. Trade Shares for Sector 372 Non-ferrous Metals. 99
D.9g. Trade Shares for Sector 381 Metal Products. 100

Introduction

The purpose of this report is to articulate a positive, feasible and effective programme of South-South co-operation in industrial development between the present time and the year 1990. If accomplished, the programme could contribute quite significantly to industrial development in the developing countries.

The report begins in Section A with a general overview of the recent experience in industrial development in the world as a whole and especially of the South's role in that development. Against this background certain criteria for identifying those specific industrial sectors with considerable potential for South-South co-operation in trade and production are developed and applied in Section B. Sectors with especially great potential for development on the basis of South-South trade and other forms of co-operation are the capital goods and basic products industries (the latter including minerals, petroleum, and other resource-based industries). The logic of South-South co-operation in the capital goods and basic products industries is further developed in Sections C and D, respectively, so as both to identify in each case those particular industrial subsectors with the greatest potential for development on the basis of South-South co-operation and to quantify that potential. Section E provides some conclusions and suggestions for further research.

For analytical convenience we shall treat the North as a homogeneous whole whereas the South is divided geographically into five separate regions. The North is defined to include North America, Western Europe (inclusive of the lower income countries of Southern Europe such as Greece, Portugal, Spain, Israel and Yugoslavia but exclusive of Turkey), Eastern Europe, Japan, Australia, New Zealand and South Africa. The five Southern regions are Latin America, Tropical Africa, North Africa-Middle East, South Asia and East Asia, Latin America is, in turn, defined to include Argentina, Bahamas, Barbados, Bolivia, Brazil, Belize, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands Antilles, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Surinam, Trinidad and Tobago, Uruguay and Venezuela. Tropical Africa is

likewise defined as Sub-Sahara Africa, 1/ while North Africa-Middle East includes the countries of North Africa from Morocco in the West to Egypt and Sudan in the East and the West Asian peninsula from Turkey in the Northwest to Iran in the East exclusive of Israel but inclusive of the island states Cyprus and Bahrain. South Asia is defined as Afghanistan, Bangladesh, Burma, India, Nepal, Pakistan and Sri Lanka. Finally, East Asia is defined to include Fiji, Hong Kong, Indonesia, The Republic of Korea, Malaysia, Sabah, Sarawak, Philippines, Singapore and Thailand.

A. Industrial Development: The Recent Experience.

The post World War II period between 1950 and 1970 witnessed remarkably high rates of overall growth in the world as a whole, and in both the North and the South. Growth rates in manufacturing value added and in trade of manufactures generally exceeded the highly satisfactory overall growth rates of Gross Domestic Product by a considerable margin, and especially so in the South. This is not to say that growth within the South was evenly spread either within countries or between countries. Indeed, there is evidence to suggest that the distribution of income in even some of the faster growing countries of the South, like Brazil and Mexico, may have become more unequal, and also it is clear that the least developed countries, the poorest of the developing countries, with a few exceptions perhaps, did not share in the generally rapid growth. Nevertheless, the overall performance was highly satisfactory.

For example, between 1960 and 1970, a period for which the statistics are rather complete, GDP of the North grew in real terms (i.e., at constant prices) at an annual rate of 5.1 per cent while that of the South grew at 5.7 per cent per annum. Manufacturing value added (at constant prices) grew at 6.2 per cent per annum in the North and 7.2 per cent per annum in the South.

1/ Specifically, Tropical Africa included Angola, Benin, Botswana, Burundi, Cameron, Cape Verde, Central African Republic, Chad, Comoros, Congo, Equatoria Guinea, Ethiopia, Gabon, Zambia, Ghana, Guinea, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Guinea-Bissau, Reunion, Rwanda, Senegal, Seychelles, Sierra Leone, Somalia, Swaziland, Tanzania, Togo, Uganda, Upper Volta, Zaire, Zambia and Zimbabwe.

Northern imports of manufactures grew at 11.9 per cent per annum and Southern imports of manufactures at 7.2 per cent. In part because of the rapid growth of Northern imports of manufactures, Southern exports were able to grow at 10.2 per cent per annum (UNIDO, 1981: World Industry in 1980. pp.90-93).

With the exchange rate adjustments of the early 1970s, the acceleration in world inflation of 1971-75 and the subsequent attempts to control it, and with the energy price rises of 1973-75 and again of 1979-80, economic growth has become much more uneven both across countries and over time and has generally decelerated especially in the North. For example, in the period 1970-77 in the North the overall growth rate dropped by 40 per cent to 3.2 per cent per annum, the growth rate of manufacturing value added fell by 50 per cent to 3.1 per cent and the growth rate of imports of manufactures fell by 45 per cent to 6.2 per cent per annum. Due in part to the rapid growth of oil exporting countries in the 1970-77 period, Southern growth was at least until recently less severely affected. Indeed, between 1970 and 1977 the overall growth rate in the South slipped only slightly to 5.5 per cent per annum. The South's growth rate of manufacturing value added was maintained at 7.2 per cent per annum, and the growth rates of Southern imports and exports of manufactures even accelerated slightly to 11.5 per cent per annum and 12.1 per cent per annum, respectively. For the first time, South-South trade which grew at 15.5 per cent per annum, began to assert itself as an engine of growth in the South. The remarkable difference in performance in manufacturing between the North and the South during the 1970-77 period is also reflected in employment in manufacturing, which did not grow at all in the North between 1970 and 1977 but which grew at 8.5 per cent per annum in developing countries (at least in the 25 countries for which the statistics are available). As a result of high interest rates and the growing international monetary and debt crises that arose thereafter, the effects of stagnation in the North have finally begun to spillover to the South.

Despite the relatively rapid growth of manufacturing value added of the South throughout the entire postwar period and especially during the otherwise slow-growth 1970s, the share of developing countries in world manufacturing value added was still no higher than 10.2 per cent in 1979. Moreover, the South's share in exports of manufactures in the same year was even smaller, i.e., less than 9.0 per cent (UNIDO 1982. A Statistical Review of the World Industrial Situation 1981).

The shares of the South in world manufacturing value added vary also very considerably from sector to sector. Table A.1. shows that the South's share of coal and petroleum products was over 30 per cent even as early as 1963 and has been maintained at over 30 per cent ever since. The South's shares in light industry and basic products are, however, much lower, but have grown from 8.8 per cent and 6.9 per cent, respectively, in 1963 to virtually 10 per cent in both cases in 1979. Note that the South lags farthest behind the North in the capital goods industries. Its share of value added in the capital goods industries, though very low, i.e., 3.6 per cent in 1963, has grown to 5.4 per cent in 1979.

Table A.1. The Share of the South in World Manufacturing Value Added of Different Sectors of Manufacturing.

UNITAD	Sector	1963	1967	1970	1975	1977	1979
2	Food Processing	14.65	14.56	15.09	15.33	15.64	16.21
5	Light Industry	8.81	8.86	8.85	10.08	9.85	9.89
4	Basic Products	6.88	7.12	7.43	9.26	9.46	9.99
3	Coal and Petroleum Products	34.52	32.62	32.51	31.47	32.94	32.59
6	Capital Goods	3.58	3.83	3.98	5.39	5.28	5.41

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

When one disaggregates the share of the South in manufacturing as a whole and in each of its major sectors into five geographic regions, namely, Latin America, Tropical Africa, North Africa - Middle East, South Asia and East Asia, as shown in Table A.2 the distribution of the South's manufacturing value added and sectoral value added among regions is likewise very unequal. For example, Latin America has maintained its share of almost 60 per cent of the South's manufacturing value added from 1963 to 1979 and shares of well over 50 per cent of the South's manufacturing value added in all sectors of manufacturing except for petroleum and coal products. At the other extreme Tropical Africa's share in Southern manufacturing value added remains at less than 5 per cent overall and in no sector was it as high as 8 per cent in 1979. Because of its rich endowments of oil and gas, the North Africa - Middle East region has rather consistently accounted for almost 40 per cent of

the South's unusually high proportions of world manufacturing value added in coal and petroleum products. Its share of Southern manufacturing value added in all other sectors, however, was no more than 10 per cent as recently as 1979. South Asia's shares were relatively high - over 20 per cent - in both light industry and capital goods in 1963 but have declined sharply since then, so that by 1979 South Asia's shares were below 11 per cent in all sectors. East Asia, on the other hand, has obtained rising shares in all sectors, but especially in light industry, basic products and capital goods, where its shares have increased by at least 80 per cent between 1963 and 1979 (from 9.6 per cent to 21.2 per cent in light industry, from 7.2 per cent to 13.5 per cent in basic products and from 9.7 to 18.2 per cent in capital goods).

Table A.2. Regional Distribution: Share of Each Region in Manufacturing Value Added of the South by Sector and Year. (in per cent)

Region	Food Processing	Light Industry	Basic Products	Coal and Petroleum Products	Capital Goods	Manufacturing Total
Latin America						
1963	60.1	56.0	64.2	44.1	61.4	57.8
1970	58.4	55.6	66.6	43.4	68.7	59.1
1979	54.6	52.6	62.8	42.1	66.5	57.3
Tropical Africa						
1963	8.3	5.1	4.2	0.4	2.9	4.9
1970	8.8	6.5	4.0	1.8	2.7	5.4
1979	7.9	6.0	3.2	1.9	1.4	4.5
North Africa-Middle East						
1963	9.5	9.1	7.7	43.4	2.8	12.3
1970	9.1	9.5	8.3	41.5	3.6	11.9
1979	9.8	9.5	10.0	38.8	5.2	11.4
South Asia						
1963	9.4	20.1	16.7	1.6	23.2	14.8
1970	10.2	16.5	13.2	2.3	16.0	12.6
1979	8.6	10.8	10.6	2.3	8.6	9.1
East Asia						
1963	12.6	9.6	7.2	10.5	9.7	10.1
1970	13.4	11.9	7.9	11.0	9.0	10.9
1979	19.1	21.2	13.5	14.9	18.2	17.7
South	100.0	100.0	100.0	100.0	100.0	100.0

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Concentrating on the period 1970-77 for which the statistical base is most complete, Table A.3 shows that all Southern regions except the South Asia region grew at rates above the world average in terms of manufacturing value added. Below-average growth rates were observed in food processing in Tropical Africa and Latin America and in coal and petroleum products in Latin America. In capital goods the South Asia region was growing only slightly below the relatively high world average rate of 6.6 per cent per annum and all other regions of the South exceeded the world average by a considerable margin.

Table A.3. Growth Rates of Value Added by Manufacturing Sector and by Region 1970-77.

UNITAD	Sector	L.A.	T.A.	N.E.	S.A.	E.A.	World
2	Food Processing	4.23	3.70	6.79	1.58	9.29	4.28
5	Light Industry	4.95	5.88	9.28	-0.34	15.15	4.33
4	Basic Products	8.50	7.70	12.49	6.94	15.94	5.01
3	Coal and Petroleum Products	3.95	4.84	5.22	2.76	8.56	4.79
6	Capital Goods	10.70	11.26	21.01	5.88	21.57	6.60
	Average	6.66	5.76	8.57	3.08	13.96	5.23

Notes: L.A. represents Latin America
T.A. represents Tropical Africa
N.E. represents North Africa-Middle East
S.A. represents South Asia
and E.A. represents East Asia

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

The variations in regional growth rates from one sector to another revealed in Table A.3 imply changes in the structure of industry. What has been the nature of those changes? Table A.4 portrays the degree of structural change that was taking place within manufacturing in the world as a whole and for each region of the South between 1963 and 1979. In the world as a whole there were noticeable declines in the shares of food processing and

light industry, relative constancy of basic products and coal and petroleum products, and a significant rise in the share of capital goods from 28.5 per cent to 34.1 per cent. In the various regions of the South, the shares of food processing and light industry tended to decline relatively faster than in the world as a whole, except in South Asia in food processing and in Tropical Africa and East Asia in the case of light industry. Instead of remaining constant as in the world as a whole, the share of basic products rose at least modestly in each Southern region, and in all regions except Tropical Africa rose by substantial amounts. The share of coal and petroleum products rose slightly from extremely low initial shares in Tropical Africa and South Asia but fell rather sharply in Latin America, North Africa - Middle East and East Asia. Finally, while the shares of the capital goods industries fell slightly in Tropical Africa and South Asia between 1963 and 1979, those in Latin America, North Africa - Middle East and East Asia rose quite sharply. The rather striking difference in structural change between these two sets of regions can largely be attributed to the difference in overall growth rates between them, South Asia and Tropical Africa being characterized by relatively slow growth and the other regions by rapid growth.

In the world as a whole and in most regions and sectors of the South labour productivity has been rising, implying that the number of employees per unit of value added (in millions of US dollars at 1975 prices) has been decreasing. Such a pattern is discernible in Table A.5 with respect to manufacturing as a whole between 1963 and 1979 in all regions of the South except in North Africa - Middle East where there was a slight rise in employment per unit of value added. There are, however, some additional exceptions at the individual sector level, i.e., light industry and coal and petroleum products in Latin America, food processing in Tropical Africa, light industry, basic products and coal and petroleum products in North Africa - Middle East, and food processing and light industry in South Asia. The small apparent declines in labour productivity in Tropical Africa and South Asia are no doubt partly attributable to the exceptionally slow growth of wage rates and capital in these regions. In North Africa - Middle East and Latin America, the exceptions noted are probably more apparent than real, the increases in employees per unit of value added probably being attributable to shifts in intrasectoral product mix toward more labour-intensive products.

Table A.4. Structural Change: Composition of Manufacturing Value Added by Region and Sector. (in per cent)

UNITAD Region	Food Processing	Light Industry	Basic Products	Coal and Petroleum Products	Capital Goods	Manufacturing Total
Latin America						
1963	27.62	30.07	20.70	9.05	12.56	100.00
1970	23.78	27.32	23.97	8.22	16.70	100.00
1979	19.87	24.35	27.39	6.41	21.98	100.00
Tropical Africa						
1963	44.53	32.03	15.58	0.93	6.93	100.00
1970	39.04	34.66	15.54	3.72	7.03	100.00
1979	36.74	35.53	17.90	3.74	6.09	100.00
North Africa-Middle East						
1963	20.54	23.08	11.71	41.93	2.74	100.00
1970	18.51	23.17	14.93	39.03	4.36	100.00
1979	17.80	22.05	21.85	29.60	8.70	100.00
South Asia						
1963	16.96	42.22	21.04	1.27	18.52	100.00
1970	19.48	38.06	22.25	2.03	18.19	100.00
1979	19.64	31.31	28.98	2.19	17.88	100.00
East Asia						
1963	33.28	29.53	13.37	12.40	11.42	100.00
1970	29.55	31.76	15.54	11.25	11.92	100.00
1979	22.47	31.73	18.99	7.33	19.47	100.00
World Total						
1963	15.47	30.06	23.04	2.91	28.51	100.00
1970	13.67	28.13	24.46	2.94	30.81	100.00
1979	12.57	26.24	24.41	2.69	34.09	100.00

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table A.5. Employment per Unit of Value Added: by Region and Sector.
(The unit of value added is one million US$ at 1975 prices.)

UNITAD Region	Food Processing	Light Industry	Basic Products	Coal and Petroleum Products	Capital Goods	Manufacturing Total
Latin America						
1963	81	148	127	13	145	104
1970	75	161	88	10	79	89
1979	68	154	78	17	64	78
Tropical Africa						
1963	129	239	260	87	287	203
1970	180	242	157	24	182	192
1979	170	205	185	40	139	172
North Africa-Middle East						
1963	233	410	356	83	593	324
1970	229	340	246	95	294	268
1979	225	445	417	112	246	341
South Asia						
1963	568	507	573	159	628	555
1970	476	456	443	112	450	450
1977	785	549	337	151	320	451
East Asia						
1963	168	412	424	17	260	280
1970	249	430	183	23	297	283
1979	92	290	91	13	175	157

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

If both output and labour productivity have been growing rapidly in most Southern regions and industries, what has been happening to employment? Table A.6 provides the basic data on employment by sector of manufacturing and by region for the years 1963, 1970 and 1979. Note that, despite increasing labour productivity, employment in manufacturing as a whole more than doubled between 1963 and 1979 in Tropical Africa and East Asia and almost doubled in Latin America and South Asia. Only in North Africa - Middle East was the increased employment relatively modest. Given the declining labour productivity in several sectors revealed in Table A.5 and the relatively rapid growth of manufacturing value added in that region shown in Table A.3, the relatively modest growth in manufacturing employment in that region can only be explained in terms of an intersectoral shift toward the more capital-intensive sectors. In all regions the largest absolute increases in employment were registered in light industry, though the capital goods industries of Latin America, and East Asia also registered impressively large increases. Unusually high rates of employment growth were also registered in food processing in Tropical Africa, and in coal and petroleum products in Tropical Africa and South Asia.

As a result of the aforementioned changes in intrasectoral labour intensity, and sectoral commodity mix, as shown in Table A.7 there have arisen some fairly substantial changes in the shares of employment in individual sectors in that of total manufacturing. In particular, the shares of food processing in total manufacturing employment declined rather sharply especially between 1970 and 1979 in the relatively industrially advanced and rapidly growing regions, Latin America and East Asia, but increased in the slowly growing and low-income regions, Tropical Africa and South Asia. The shares of light industry declined slightly in Latin America and South Asia, rose slightly in North Africa - Middle East and East Asia and rose sharply in Tropical Africa. One might have suspected that the share of light industry in manufacturing employment would have declined in East Asia as in Latin America had it not been for the rapid growth of East Asia's exports of light industry. The trends in the employment shares of basic products are almost the reverse of those of light industry. In other words, the trends reveal a sharp decline in Tropical Africa, moderate declines in North Africa - Middle East and East Asia and slight increases in Latin America and South Asia. Despite some substantial changes in output and productivity in coal and petroleum products, this sector remainings insignificant as far as employment

Table A.6. Employment in the Manufacturing Sectors: by Region.

UNITAD Region	Food Processing	Light Industry	Basic Products	Coal and Petroleum Products	Capital Goods	Manufacturing Total
Latin America						
1963	804	1349	927	40	589	3709
1970	1072	1837	1205	31	823	4967
1979	1256	2407	1772	42	1510	6987
Tropical Africa						
1963	103	172	114	2	43	434
1970	199	334	102	2	47	684
1979	299	522	162	5	67	1054
North Africa-Middle East						
1963	183	401	231	12	86	914
1970	204	435	175	17	78	909
1979	251	572	281	22	108	1234
South Asia						
1963	794	2092	735	12	796	4430
1970	873	2153	1234	21	1133	5413
1979	1629	3165	1428	63	1166*	7451*
East Asia						
1963	340	835	342	24	211	1751
1970	704	1417	319	19	397	2856
1979	710	2456	589	21	1118	4894

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Note: * indicates 1977 value.

is concerned in all regions. Finally, in the case of capital goods, despite rapid growth in most regions, the declines in employment shares were experienced in three of the five Southern regions. Only in Latin America and East Asia did the shares in overall manufacturing employment rise and even in these cases the increases in employment shares were much less pronounced than

Table A.7. Shares of Sectoral Employment in Total Manufacturing Employment. (in per cent)

UNITAD Region	Food Processing	Light Industry	Basic Products	Coal and Petroleum Products	Capital Goods	Manufacturing Total
Latin America						
1963	21.7	36.4	25.0	1.0	15.9	100.0
1970	21.6	37.0	24.2	0.6	16.6	100.0
1979	18.0	34.4	25.4	0.6	21.6	100.0
Tropical Africa						
1963	23.6	39.7	26.3	0.4	9.9	100.0
1970	29.1	48.8	14.9	0.5	6.9	100.0
1979	28.3	49.5	15.3	0.5	6.4	100.0
North Africa-Middle East						
1963	20.1	43.9	25.2	1.3	9.4	100.0
1970	22.4	47.8	19.3	1.8	8.6	100.0
1979	20.4	46.4	22.7	1.7	8.8	100.0
South Asia						
1963	17.9	47.2	16.6	0.3	18.0	100.0
1970	16.1	39.8	22.8	0.4	20.9	100.0
1979	23.1	44.9	20.2	0.9	10.9	100.0
East Asia						
1963	19.4	47.7	19.5	1.4	12.0	100.0
1970	24.6	49.6	11.2	0.7	13.9	100.0
1979	14.5	50.2	12.0	0.4	22.9	100.0

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

had been the case with respect to value added (as shown in Table A.4.) For the same reason in the case of North Africa - Middle East what was a substantial rise in the share of capital goods in total manufacturing value added in Table A.4 becomes a slight decline in employment share in Table A.7. Only in the case of East Asia which experienced only moderate growth in productivity did the increasing share remain substantial (from 12 per cent to just under 23 per cent).

Table A.8. Gross Production and Apparent Consumption at 1975 Prices and Shares of Gross Production in Apparent Consumption by Sector and Region

Sector	Region	Gross Production			Apparent Consumption			Share of Gross Production in Apparent Consumption		
		1970	1975	1977	1970	1975	1977	1970	1975	1977
Food	North	528.9	627.9	673.9	532.0	631.2	670.4	0.994	0.994	1.005
Process-	South	93.0	112.1	121.2	89.9	108.8	124.7	1.034	1.030	0.972
ing	L.A.	49.1	58.8	61.0	45.6	53.4	57.9	1.078	1.100	1.052
	T.A.	8.6	9.2	10.1	8.6	9.4	11.4	1.000	0.978	0.892
	N.E.	11.9	15.7	17.1	13.0	20.6	22.7	0.916	0.762	0.753
	S.A.	19.1	19.2	20.8	18.5	18.3	20.7	1.034	1.051	1.007
	E.A.	11.2	15.3	17.9	11.4	16.0	17.6	0.981	0.952	1.014
Light	North	760.1	861.5	1084.8	759.7	858.9	1083.1	1.001	1.003	1.002
Industry	South	98.1	129.5	121.3	98.5	132.0	123.0	0.996	0.981	0.986
	L.A.	40.9	52.8	50.4	42.2	54.3	51.0	0.968	0.973	0.988
	T.A.	5.5	7.3	5.2	7.3	9.8	7.9	0.751	0.743	0.659
	N.E.	7.9	12.4	12.1	9.2	18.4	21.7	0.852	0.670	0.558
	S.A.	22.3	22.6	21.3	20.4	20.8	19.8	1.094	1.087	1.075
	E.A.	11.9	20.3	20.0	10.6	16.9	13.4	1.122	1.200	1.490
Basic	North	822.1	938.6	1064.4	810.9	909.4	1037.8	1.014	1.032	1.020
Products	South	70.1	103.4	112.1	81.3	132.6	138.6	0.862	0.780	0.808
	L.A.	38.2	54.6	58.5	41.1	62.0	63.7	0.930	0.880	0.918
	T.A.	2.8	4.2	3.8	0.9	5.7	5.7	3.000	0.741	0.658
	N.E.	5.9	10.7	10.6	9.2	20.5	20.2	0.672	0.521	0.528
	S.A.	11.4	14.3	17.2	13.0	16.2	18.3	0.875	0.882	0.940
	E.A.	5.2	9.6	12.2	7.8	14.5	17.0	0.675	0.661	0.714

Table A.8. continued

Capital	North	926.3	1153.5	1335.5*	893.1	1802.0	1418.1*	1.037	1.066	0.942
Goods	South	44.8	78.5	80.8	78.0	149.9	163.3	0.575	0.524	0.494
	L.A.	29.3	50.5	50.4	40.8	69.7	70.1	0.718	0.725	0.719
	T.A.	1.2	1.9	1.7	6.4	12.7	15.3	0.194	0.149	0.109
	N.E.	1.7	4.5	4.7	7.4	30.9	39.6	0.225	0.145	0.119
	S.A.	8.5	10.3	11.5	10.3	12.4	13.7	0.824	0.832	0.841
	E.A.	3.9	8.6	9.6	8.6	16.9	17.9	0.459	0.507	0.534

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the Unido Secretariat.

Note: L.A. represents Latin America
T.A. represents Tropical Africa
N.E. represents North Africa-Middle East
S.A. represents South Asia
E.A. .represents East Asia

* Indicates that there is most likely a statistical discrepancy in the figures for 1977 since the share of production in apparent consumption would presumable have to exceed unity in at least one region, and North is the only region for which this would appear likely.

Perhaps even more revealing of structural changes in both the North and the South with respect to the different manufacturing sectors are the changes in the proportion of domestic production to apparent consumption.[1/] Shares of gross production in 1975 prices in apparent consumption (along with the underlying data on production and apparent consumption) for the years 1970, 1975 and 1977 are presented in Table A.8 for each of the major manufacturing

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1/ Apparent consumption is defined as production plus imports less exports.

sectors (other than the coal and petroleum products sector which as noted above was already well developed in the South before 1970). Although not shown specifically, net exports at 1975 prices can be computed easily: specifically by subtracting apparent consumption from gross production. Naturally, a low share of gross production in apparent consumption for any region implies a considerable degree of net dependence of that region on imports, but also therefore the potential for future import substitution. A share in excess of unity, on the other hand, implies the existence of net exports.

Each of the four manufacturing sectors included in Table A.8 displays a rather different pattern of changes in these shares. In food processing the North's share was rising slowly while that of the South was falling between 1970 and 1977. Within the South the shares of gross production in apparent consumption of the same sector were falling especially rapidly for both Tropical Africa and North Africa - Middle East. In both light and basic industry the shares of the North and South were constant although there were some significant and different trends in the different regions of the South. In particular, in light industry the production shares were rising for Latin America and especially East Asia, but falling for Tropical Africa, North Africa - Middle East and South Asia. In basic products the rising shares were in East Asia and South Asia and the falling shares in Tropical Africa and North Africa - Middle East. Finally, with respect to capital goods, despite rapid growth in production, the shares of production in apparent consumption between 1970 and 1977 fell in the South as a whole and in Tropical Africa and North Africa - Middle East, in particular. They rose very slightly in South Asia but quite substantially in East Asia.

The only patterns that are consistent across industries are that the shares of production in consumption of all sectors are rising in East Asia and falling in Tropical Africa and North Africa - Middle East. The latter do not necessarily imply declines in all countries of the region but rather may represent shifts in relative income from countries with relatively high shares of production in apparent consumption such as the oil-importing developing countries to those with relatively low such shares as in the oil-exporting countries.

A more complete picture of the trends of the North and South for each manufacturing sector can be found in Tables A.9 and A.10. Table A.9 presents the 3 x 3 (North, South and World) trade flow matrices in millions of US dollars at 1975 prices for each of the same four manufacturing sectors for the years 1970, 1975 and 1977. Table A.10 contains the annual growth rates for the period 1970-77 corresponding to and derived from the 1970 and 1977 flows presented in Table A.9. These tables highlight the findings (also evident in Table A.8) that the Northern exports have been growing much faster than Southern exports of food products while Southern imports have been growing considerably faster than Northern imports. South-South trade in food processing, however, has also been growing quite rapidly. Although the pattern is somewhat similar for basic industry, in this case South-South trade has been growing faster than any other flow in the table. For light industry and capital goods, however, it is an entirely different story. Both Southern exports and imports have been growing considerably faster than those of the North. In both cases, moreover, the South-South flows have been growing faster than those of any other cell in the matrix, and in the case of capital goods by quite a large margin.

Table A.9. Matrices of Trade Flows for 1970, 1975 and 1977 by Manufacturing Sectors. (In Millions of U.S. Dollars at 1975 Prices.)

	1970			1975			1977		
Food Processing									
Origin \ Destination	North	South	World	North	South	World	North	South	World
North	27,832	6,824	34,656	34,678	9,468	44,146	38,878	12,082	50,960
South	9,877	2,574	12,451	12,753	5,062	17,815	8,536	4,396	12,932
World	37,709	9,398	47,107	47,431	14,530	61,961	47,415	16,478	63,892
Basic Products									
	North	South	World	North	South	World	North	South	World
North	87,660	21,756	109,416	102,980	37,108	140,088	114,298	36,527	150,825
South	10,547	3,232	13,779	7,917	4,702	12,619	9,935	5,584	15,519
World	98,207	24,988	123,195	110,897	41,810	152,704	124,233	42,111	166,344
Light Industry									
	North	South	World	North	South	World	North	South	World
North	69,087	14,528	83,615	84,312	20,079	104,391	87,746	23,303	111,049
South	14,113	5,912	20,025	17,536	7,970	25,505	21,605	19,523	31,128
World	83,199	20,440	103,640	101,848	28,048	129,896	109,351	32,826	142,177
Capital Goods									
	North	South	World	North	South	World	North	South	World
North	128,298	38,736	167,034	204,117	82,982	287,099	241,146	97,677	338,823
South	5,600	1,835	7,435	11,558	6,110	17,668	15,094	8,986	24,081
World	133,897	40,571	174,469	215,675	89,092	304,767	256,241	106,663	362,904

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table A.10. Growth Rates of Trade Flows (in Real Terms) of Manufacturing Sectors by North and South. (in per cent) 1970-1977.

Food Processing

	North	South	World
North	4.27	7.40	4.94
South	-1.81	6.92	.47
World	2.90	7.27	3.90

Basic Products

	North	South	World
North	3.37	6.69	4.09
South	-.74	7.07	1.50
World	2.98	6.74	3.82

Light Industry

	North	South	World
North	3.03	6.08	3.61
South	5.47	6.14	5.67
World	3.48	6.10	4.03

Capital Goods

	North	South	World
North	8.21	12.16	9.24
South	13.91	21.97	15.82
World	8.45	12.84	9.59

Source: From Table A.9.

Summary

The South has managed to achieve relatively rapid growth rates of GDP, manufacturing output and exports of manufacturing over most of the last thirty years. Of course, the period between 1980 and 1983 when the world economy has been plunged into its deepest recession since the World Depression of the 1930s, has been an important and rather painful exception. Nevertheless, despite its impressive achievements the South's shares of manufacturing output and exports remain extremely low, slightly above 10 per cent of world manufacturing value added and less than 9 per cent of world exports of manufactures as recently as 1979. The South lags farthest behind the North in the capital goods sector of manufacturing where its shares of world value added and exports are both less than 7 per cent. This latter aspect of this performance bodes particular difficulties for increasing the overall percentage of manufacturing because of the rapidly growing share of capital goods in world manufacturing output and trade.

Another disturbing aspect of the overall performance of the South in manufacturing is the high concentration of the South's manufacturing value added in one region, Latin America. Latin America's share remains at almost 60 per cent of the total in all sectors except coal and petroleum products which is of negligible importance in terms of employment. In contrast, Tropical Africa's share of the South's total, at least as of 1979, remained at only 4.5 per cent. East Asia's share has risen rapidly, especially since 1970, but was offset by a sharp decline in the share belonging to South Asia.

With growth rates in output and labour productivity varying substantially not only from one region to another but also from one sector of manufacturing to another, all regions of the South have been experiencing substantial changes in the structure of value added, employment, and trade. With respect to value added, for example, in most regions, the shares of the traditional industries, i.e., food processing and light industry, in manufacturing value added have been declining whereas those of basic products and capital goods have been increasing. Four of the exceptions, the rising shares in Tropical Africa of light industry, and in South Asia of food processing and the decreasing shares of capital goods in the same regions are attributable to the slow growth in income and yet burgeoning population growth of these regions.

The only other exception, the rising share of light industry in East Asia is attributable to that region's remarkable success in exporting such products to the North. Despite the rapid growth of basic products and capital goods in value added, the traditional industries, food processing and light industry, account for more than half of manufacturing employment in all regions and over three-fourths in Tropical Africa. Only in capital goods and to a lesser extent basic products are the Southern shares of production in apparent consumption sufficiently low to indicate much further potential for import substitution in the South as a whole.

B. Criteria for Identifying Potential for South-South Trade and Industrial Development.

The purposes of this section are: (1) to develop criteria for identifying those industries with special potential for development through South-South trade and co-operation and (2) to apply the criteria so as to identify the most promising sectors and subsectors of industry (to be analyzed in more detail in Sections C, and D below).

While very considerable attention has been given in the existing literature to the determinants of the international division of labour in general and of North-South trade in particular, 1/ very little attention has been given to the determinants of South-South trade. While the conspicuous lack of attention to the determinants of South-South trade could be excused if the determinants of such trade were likely to be similar to those of trade in general, recently however, Krueger, Bhagwati and their associates 2/ have provided rather convincing evidence that, in fact, the determinants of South-South trade are quite different from those of North-South trade. For example, Corbo and Meller (1978) show that variations in factor endowments across different countries, together with variations factor-intensity across different sectors explain the nature of both Southern exports to the North and Northern exports to the South but not the nature of South-South trade. While Southern exports to the North tend to be relatively labour-intensive and Southern imports from the North tend to be relatively capital-intensive (at least after standardizing for other factors such as skills and land), Southern exports to the South cannot be characterized in any such way.

If it is not possible to explain the determinants of South-South trade satisfactorily, it would be difficult and indeed dangerous to proceed to the identification of specific sectors with the potential for South-South trade

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1/ Indeed, virtually all of the enormous literature on international trade theory has been devoted to this issue, with the classical, neoclassical and product-cycle theories standing out as particularly important alternative explanations. See for example Caves and Jones. (1973)

2/ See Krueger (1977a, 1977b, 1978) Bhagwati (1978) and Corbo and Meller (1978).

and industrial development. In view of the fact that industrialization has long been viewed as the primary - if not the exclusive - motive for South-South co-operation efforts,[3/] this is indeed a significant shortcoming.

Recently, however, Yeats (1981, Chapter 3) has suggested that Southern exports to the South should be labour-intensive in spite of the aforementioned evidence that existing Southern exports to the South are not labour-intensive. Moreover, in order to demonstrate (and quantify) likely sources of potential for South-South trade, Yeats went on to propose that for all manufactured goods, the technology of which could be classified as labour-intensive (and hence which could be considered as candidates for Southern exports to both the North and the South), such potential could be measured by the minimum of the following: (1) the value of Southern imports from the North and (2) that of Northern imports from the South. Since for most manufactured commodities the value of Northern exports to the South greatly exceeds the value of Southern exports to the North, in practice Yeats' measure of potential for South-South trade is in almost all cases the current value of Southern exports to the North. Applying this measure to a list of industries identified as labour-intensive in previous studies, Yeats found the potential for South-South trade in industrial products to be only a small fraction of current imports of the South from the North.

Although his suggestions of (a) basing the measure of potential for South-South trade in manufactures on the potential for import substitution (measured by actual (or projected) imports of the South from the North) and (b) proposing that realistically and economically such a measure would need to be qualified by some measure of demonstrated competitiveness are both well-taken, neither labour-intensity nor the level of existing Southern exports to the North would seem appropriate as measures of demonstrated competiveness.

As a substitute for labour-intensity of technology as a criterion for potential for development via South-South trade and co-operation, it is hereby proposed that the criterion should be that production is intensive in the use of factors which, collectively at least, although not available in sufficient

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3/ See Cooper and Massell (1965), Johnson (1965) and Balassa (1971).

quantities in any single country of the South, are available in sufficient quantity and quality in the South as a whole. Likewise as a substitute for actual exports of the South to the North as a measure of demonstrated competiveness, we propose above-average growth rates in both production and exports of such products by the South. Finally, in recognition of the importance of dynamic factors in both the determinants and the effects of trade, attention on the one hand is diverted from those sectors characterized by high rates of new product development but on the other hand is focussed on those sectors in which the learning-by-doing benefits of production are particularly important. The reason for excluding from consideration sectors with high rates of new product development is that the ability to compete successfully in this respect is thought to require investments in research and development, scientific communities of such quality, and institutional environments of such size, quality, competitiveness and sophistication (including patenting and copyright systems) as to go well beyond the capabilities and capacities of developing countries in the near future. On the other hand, the reason for favouring sectors in which learning-by-doing is deemed important is that, when this is the case, there is no substitute for experience in production as far as long-term labour skills managerial development, and technical efficiency are concerned. Often such benefits can be quite substantial and take the form of externalities not reflected in the ordinary calculus of internal benefits and costs.

Table B.1 assembles some relevant indicators of these criteria in so far as possible for each of the three-digit ISIC manufacturing sectors grouped into the aforementioned five commodity groups, i.e., food processing, light industry, basic products, coal and petroleum products and capital goods.

As shown in the first section of the table, food processing industries tend to use little in the way of scarce resources - though in terms of capital- intensity they are above-average in one of the indicators. More importantly, however, as shown in the last column of the table, the share of imports from the North in apparent consumption is less than 10 per cent in each such industry. For these reasons these sectors would seem quite unpromising for development via South-South co-operation.

Turning now to the light industries shown in the second section of the table, it can be seen that all are below average in energy-intensity and all

except ISIC 342 (printing and publishing) and ISIC 381 (metal products) are low in skill - and human capital - intensity. Only ISIC 355 (rubber products) is above-average in capital-intensity. ISIC 342 (printing and publishing), however, can be ruled out of consideration on the grounds that it has both a high index of new product development and a share of Southern imports from the North that is less than 10 per cent. While light industry in general would not seem promising for development via South-South co-operation, the rubber and metal products sectors would seem to be rather promising .

With respect to basic products, all subsectors except paper are energy-intensive, and all are either skill - or human capital-intensive or (physically) capital-intensive or both. All except ISIC 361 (pottery and china) have shares of Southern imports from the North in excess of 10 per cent, and only ISIC 371 (iron and steel) has a high rate of new product development. Except for these two subsectors, therefore, basic industries would seem relatively promising for development via South-South co-operation.

Coal and petroleum products - which in many ways are similar to basic products in the sense that they are essentially mineral and fuel processing industries - are somewhat similar in that they are intensive in resources that are scarce in at least some regions of the South but not others. However, as already pointed out this industry is already relatively well developed in the South as a whole and also a considerable degree of specialization in the North Africa-Middle East region has already been accomplished.

Capital goods industries are not energy-intensive but tend to be above-average in skill - and human capital-intensity, and in some sectors and according to certain measures are also (physical) capital-intensive. Although ISIC 384 (transport equipment) and 385 (scientific instruments) are classified as high in rates of new product development, as shown in the last column all sectors have exceptionally high proportions of Southern imports from the North in apparent consumption. With the exception of ISIC 385 and 390, therefore, capital goods industries would appear especially promising for Southern development via South-South co-operation.

While there is no index of learning-by-doing that is available on a comprehensive basis across industries, the machinery and other engineering

industries (usually including metal products here classified among the light industries) are almost invariably considered to be among the highest. These learning-by-doing benefits add to the other credentials of the capital goods and rubber and metal products industries as priority sectors for development on the basis of South-South co-operation.

Table B.1. Criteria for Potential Development via South-South Trade and Co-operation.

ISIC Sector	Indicators of Intensity in Resource Use: Energy[a]	Skilled Labour[b]	Human Capital[c]	Capital ICOR[d] DC	Capital ICOR[d] LDCs	Capital K/L[c]	Capital VA/L[a]	Index of New Product Development[b]	Share of Southern Imports from the North in Consumption of the South[d]
Food Processing	.039	-	-	.99	.60	-	112	-	.082
311/2 Food Processing	.050	-	-	1.46	.82	-	103	-	.095
313 Beverages	.034	-	-	.60	.48	-	150	-	.069
314 Tobacco	.034	-	-	1.13	.25	-	179	-	.042
Light Industry	.050	L	18.6	.76	.91	8.30	72	-	.172
321 Textiles	.043	L	17.8	.98	1.32	9.40	64	L	.148
322 Wearing Apparel	.043	L	12.0	.46	.49	2.02	49	L	.092
323 Leather	.025	L	17.3	.76	.63	5.86	53	L	.088
324 Footwear	.025	L	-	.60	.45	-	-	L	.071
331 Wood	.054	-	12.2	.97	1.09	11.27	59	-	.108
332 Furniture	.054	L	21.7	.63	.76	4.52	68	L	.150
342 Printing	.055	H	36.2	.63	.66	8.42	94	H	.086
355 Rubber	.087	L	18.6	1.23	.70	10.19	102	L	.245
356 Plastic	.087	L	18.6	.72	.88	10.19	83	H	.343
381 Metal Products	.039	H	27.9	.90	.65	9.07	93	L	.255
Basic Products	.216	-	25.5	1.86	1.18	28.85	129	-	.303
341 Paper	.055	-	30.1	1.72	.68	32.94	115	-	.261
351 Industrial Chem.	.195	H	30.1	2.20	1.90	32.94	116	L	.416
352 Other Chemicals	.195	H	40.1	.96	.38	57.61	105	L	.113
361 Pottery	-	L	33.0	1.91	2.61	41.42	193	L	.046
362 Glass	-	L	33.0	1.18	.69	41.42	193	L	.176
369 Non-Metallic Minerals	.198	L	10.0	1.94	1.42	11.04	100	L	.125
371 Iron, Steel	.415	L	10.0	2.47	2.04	11.04	154	H	.446
372 Non-Ferrous Metals	.415	-	10.0	1.67	1.27	11.04	154	-	.434

Table B.1. continued.

Petroleum and Coal Products	3.495	-	65.6	1.09	.98	126.11	220	-	-	
353 Petroleum Refining	1.868	-	65.6	1.39	1.06	126.11	220	-	-	
354 Petroleum and Coal Products	5.122	-	65.6	1.04	.70	126.11	220	-	-	
Capital Goods	.035	H	28.4	.77	.69	9.68	107	-	.603	
382 Non-Electric Machinery	.029	H	290	.72	.75	10.04	105	L	.461	
383 Elec. Machinery	.034	H	30.8	.75	.70	7.12	96	L	.471	
384 Transport Equip.	.041	L	27.1	.86	.73	11.60	122	H	.757	
385 Scientific Instruments	-	H	41.2	.86	1.21	11.15	117	H	1.264	
390 Other	.057	L	17.8	.60	.59	5.67	81	H	-	
Whole Economy	.104	-	28.3	.99	.89	20.52	107	-	-	

Notes: a. Computed from the sector-specific imput value of energy relative to the sectoral value added from a 1975 Input-Output table for France that is in the UNIDO data base.

b. From UNIDO 1981b, pp 103-108.

c. From Balassa 1979.

d. Computed from UNIDO data base; information supplied by the Office of Development Research and Policy Analysis for years 1967-1977.

e. From Lary 1968.

ICOR represents incremental capital-output ratio.

DC represents developed countries.

LDC represents developing countries.

H and L represent High and Low, respectively. For criteria used in such classifications, see the original studies.

Summary

Four criteria, or more precisely necessary and jointly sufficient conditions, are suggested for identifying sectors with potential for South-South cooperation and development.

(1) Technology of production must be characterized as being intensive in the use of the factors which, although not available in sufficient quantities in any single country of the South, are so available in the South as a whole;

(2) The industry should not require a high rate of new product development;

(3) The competitiveness of Southern production should be demonstrated on the basis of above-average growth rates in both production and imports of such products by the South.

(4) The learning-by-doing benefits of actual production should be relatively great

The application of these criteria lead to the identification of capital goods, basic products and the rubber products and metal products subsectors of light industry as the most promising for development on the basis of South-South cooperation.

C. Capital Goods Industries: The Primary Focus for South-South Co-operation and for Industrialization of the South during the 1980s

While there are many other areas or aspects of manufacturing wherein the South may be able to make significant progress in industrialization in the coming decades, there is none so important in quantitative potential, so central to reducing excessive and semi-permanent technological dependence on the North, or so vital to the overall development of the South as the development of its capital goods industries. At the same time, while import substitution at the national level has served and will continue to serve as a vehicle for industrial growth in the South of some industrial sectors, especially finished consumer goods, and exports to Northern markets can constitute a logical source of growth for raw material processing industries and light industries, neither strategy is viable or appropriate for capital goods industries. On the one hand, the development of any such industry in the South requires a size of market, a degree of specialization and division of labour, and especially a level of sophistication in marketing and technical knowhow, that go well beyond the bounds of what is feasible in even the most ambitious of national development plans of developing countries. On the other hand, since a major, (though not necessarily dominant) reason for the development of capital goods industries in the South is to develop capital goods that are more appropriate to the relative factor endowments and small-scale conditions of developing countries, and since the most rapidly growing markets for capital goods are in the South, it is appropriate that markets for their output be sought primarily in the South. For these reasons, not only may the substantial development of capital goods or engineering industries be considered beneficial and feasible only within a programme of South-South co-operation, but also and at the same time capital goods development may be expected to constitute one of the principal foci for South-South co-operation in industrial development.

This section is organized as follows: The rationale for the development of capital goods industries in the South, which was in part developed in Section B above is further developed in Part 1. This is followed in Part 2 by an overall account of both the obstacles to the development of such industries in the South and the means of overcoming them. In Part 3 the recent experience in production and trade of developing countries and regions thereof

relative to the rest of the world is examined from the point of view of identifying specific subsectors of capital goods for which there exists considerable potential for development on the basis of South-South co-operation.

1. General Rationale for Capital Goods as the Focus for Industrial Development and South-South Co-operation during the 1980s

While the rationale for emphasis on capital goods in industrial development of the South and in South-South co-operation has been stated in Section B above, because of the importance of such an emphasis and the degree of its departure from orthodoxy, some repetition and further articulation of the argument would seem warranted.

As noted above, the South's overall share in world exports (at current prices) had reached more than 30 per cent by 1978[1/] and apparently has risen slightly since then. Indeed, the South's shares of world exports of agricultural and energy products are considerably higher (currently about 36 per cent and 70 per cent, respectively). Only in manufactures exports is the South's share relatively low (about 10 per cent) and in most categories of manufactured goods it is considerably higher than that. Notably, it is 18 per cent in consumer non-durables, 9.5 per cent in intermediate goods and 9 per cent in consumer durables. In great contrast, however, the South's share in world exports of capital goods was only a little over 6 per cent as recently as 1979. Likewise, although the South's share in world consumption of capital goods is high and rising, the South's share in world value added in the capital goods industries of only a little over 5 per cent as recently as 1979 lags far behind that of the South in all other sectors, including even the other manufacturing sectors where that share exceeds 10 per cent. The overall backwardness of developing countries as a whole with respect to capital goods industries becomes even greater once one realizes that, because of the concentration of Southern capital goods production in the 10-12 newly industrializing developing countries (NICs), most developing countries have no capital goods industry whatsoever (UNIDO 1981a).

1/ See Table C.1 below.

Because the South's production and exports of capital goods both remain low despite the fact that Southern demand for capital goods constituted over 20 per cent of world demand, imports of capital goods by the South are estimated to constitute 30 per cent of the world's total. For this reason the development of capital goods can be considered to be an important and indeed strategic element for the development of the South. Not surprisingly, therefore, Southern capital goods or engineering industries have frequently been put at the top of the list for special attention and priority treatment in international meetings and conferences of developing countries. Among the most important such conferences have been the Lima Declaration and Plan of Action on Industrial Development and Co-operation, UNIDO's Second General Conference held in Lima, Peru in March 1975, the New Delhi Declaration and Plan of Action, and numerous other conferences and documents of UNIDO and of other regional and international organizations. Such plans, however, have yet to be either fully justified on economic grounds or articulated into a feasible programme of implementation. Nor has the potential role of South-South co-operation in both such activities been sufficiently well developed and spelled out.

While the fact of underdevelopment of Southern capital goods industries may be rather clearly established, this is hardly sufficient for justifying their development as a priority for the South and indeed for the world. What was pointed out in section B above is that capital goods production tends to require inputs which are not all available in sufficient quantity and quality in any one region of the South but which are available in the South as a whole. But can the high priority to capital goods production in the South be justified? Is it feasible and efficient for the South to produce its own capital goods? In the following paragraphs, we argue that the answer is "yes" and we attempt to explain why such an answer is appropriate. Indeed, it is argued that there are several reasons for believing that these sectors are fully deserving of priority treatment both for industrial development of the South and for South-South co-operation. The pros and cons of Southern capital goods production and of South-South co-operation in this industry are developed under the following three headings: static efficiency, dynamic efficiency and appropriate technology.

a) STATIC EFFICIENCY

For example, in terms of labour productivity of developing countries relative to that of developed countries, and employment per unit of capital as a measure of labour-intensity, capital goods industries, in general, are generally no better than average (Pack, 1981; Mitra, 1979; UNIDO, 1981).

Most studies assign priorities among industries for development by the South on the basis of traditional static criteria such as relative factor productivity, or factor-intensity. On both of these counts capital goods industries, at first glance at least, do not appear particularly attractive,[2/] thereby accounting at least in part for the exceptionally low shares of the South in both production and exports of capital goods.

Nevertheless, there are several factors that should be considered in this respect. First, with respect to labour-intensity, while capital goods industries as a whole are of only average labour-intensity among manufacturing industries, the variation in labour-intensity among subsectors of this industry is sufficiently great that subsectors, such as agricultural machinery, office machinery, metal-working machinery, ships and boats, etc., are, indeed, some of the most labour-intensive of all industries (Rahman, 1973; Lary, 1968; Hufbauer, 1970; UNIDO 1981a, 1981b).

The second such consideration concerns economies of scale. The dominance of industries by large firms is usually considered to be indicative of the importance of economies of scale. The existence of such economies is, in turn, considered to make it difficult for developing countries (especially those characterized by small markets) to be competitive with developed countries which, because of their greater market size, are better able to take advantage of these economies. The fact that there are, indeed, numerous capital goods, such as woodworking machinery, conveyors, dies, tools and jigs, and machine tool accessories, where small firms dominate and hence where scale economies are not

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2/ See for example the not particularly low levels of capital and skill intensity of this sector as shown in Table B.1. above.

important, implies that production of at least some capital goods in developing countries may not be disadvantaged by economies of scale considerations.3/

Third, even within subsectors of the engineering or capital goods industry, cost studies of such industries in developing countries reveal a great deal of variation in efficiency and cost from one firm to another. Such variations tend to underscore the importance in the determination of comparative costs and hence efficiency comparisons of management and other firm-specific characteristics (X-efficiency, etc.) relative to the more traditional determinants of such costs, namely factor proportions. Some capital goods producers in developing countries are, therefore, bound to be competitive even in the less labour-intensive subsectors of capital goods (Mitra, 1979; Pack, 1981).

The implication of these considerations is that factor-intensity, relative factor efficiency and scale economies cannot be considered fundamental obstacles to the development of capital goods in developing countries. Some subsectors of capital goods are labour-intensive and yet also are not characterized by economies of scale. Static efficiency would seem to depend to a much larger extent on more particular factors, such as quality of managerial personnel, plant layout, and information availability, than upon factors more closely associated with traditional (neoclassical) trade and development theory. Even currently inefficient and/or unprofitable firms may become efficient and profitable with improved management, better information, better plant layout, and so on.

This does not necessarily mean that static efficiency considerations would make all or even any capital goods industries viable in all developing countries. Indeed, there are other considerations that may well limit the number and type of developing countries in which anything more than the most rudimentary capital goods sector can be developed. Most importantly, many subsectors of capital goods tend to be skill-intensive,

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3/ See especially Mitra (1979), UNCTAD (1982).

i.e., they require large amounts of skilled labour which frequently is in short supply in developing countries. The facts are, however, that there are some developing countries, such as India, Pakistan, Egypt, Singapore, Argentina, and Lebanon, where skilled labour is in abundant supply, and, indeed, where the low-wage advantage of developing countries is even greater than that with respect to unskilled labour. It is also the case, once again, that there are some capital goods, such as railway cars, trailers, truck assembly, and hand tools, where skills are not important (UNIDO, 1981),and hence where production of capital goods may be both feasible and economic even in countries not well-endowed in skilled labour.

Hence, on balance, even on the basis of traditional static efficiency considerations, there is little reason to doubt that at least some types of capital goods could be produced and exported in most developing countries and that substantial capital goods sectors could be developed in those countries of the South with especially low wage rates and ample supplies of skilled workers and good managers.

b) DYNAMIC EFFICIENCY

The division between static efficiency and dynamic efficiency is, of course, an arbitrary one. Mention has already been made in the above discussion of static efficiency of the fact that plant layout, management and other elements of non-traditional static efficiency are likely to be of greater importance in determining the viability of capital goods production in developing countries than the traditional sources of static efficiency, such as factor proportions. A crucial ingredient of the efficiency of a firm at a single point in time is its utilization of the physical and human capital at its disposal (Mitra, 1979; Pack, 1981). Since insufficiency of market tends to be a major cause of underutilization and because market penetration tends to require both time and investments in the form of sales promotion, the attainment of efficiency can be seen as a dynamic process. This is particularly true in capital goods because ability to market quite naturally depends to a large extent on experience-in-use, including the cost and timeliness of maintenance and the availability of replacement parts.

Since many subsectors of capital goods involve relatively unstandardized goods, e.g., machines of different size, power and function, the market for any one of which may well be rather small, the utilization and hence efficiency of plants producing capital goods can be enhanced by producing several product lines within a single plant. On the other hand, there are "down-time" costs involved in switching from one product line to another implying that efficiency can usually be increased by lengthening the duration of the production runs of individual product lines and by concentrating on fewer product lines. This can be done either by increasing market size (through penetration of new markets) or by increasing the degree of specialization in satisfying given market demand through a system of subcontracting or the co-ordination and specialization that can be arranged by multinational or transnational corporations (TNCs).

By and large, engineering or capital goods industries are particularly notable for the substantial amount of learning-by-doing that derives from experience in producing them.[4/] If these learning-by-doing benefits are derived by agents external to the firms themselves,[5/] and hence if externalities arise, these externalities can justify policy intervention, as for example to subsidize production and/or export of such industries (Mitra, 1979). Nevertheless, since the source of such benefits, their magnitude, and the particular parties that derive the benefits, all vary considerably from case to case, each such case must be thoroughly investigated before the appropriate policy (if any) can be identified. In any case, however, as a general rule, the learning-by-doing benefits tend to be substantial, implying that (directly or indirectly) reductions in the social cost of production may be expected to occur as experience in production accumulates. An even more common form of these learning-by-doing benefits is the greater ability to inno-

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4/ See Hirsch (1956), Alchian (1963) Rapping (1965), Sheshinski (1967) and Dudley (1973).

5/ While this may occur in various circumstances, it frequently occurs when the workers or managers who do the learning are free to move to other firms or to other countries, or when the workers or managers are recruited from abroad.

vate, to produce new products, and/or to penetrate new markets (such as those in the North) that derives from experience in production and marketing. Whereas in other industries there may be advantages of delaying entry into the industry in order to take advantage of more up-to-date technology, in capital goods the delay of entry may well impose substantial opportunity costs on would-be producers in the form of the learning-by-doing benefits foregone by such delay.

Another dynamic benefit of capital goods industries for the South is the various kinds of linkages that such industries exert on and to other parts of the economy. Capital goods industries generally rank above-average on interindustry linkages (both forward to industries using capital goods and backward to industries providing the inputs for such industries). As already mentioned, they also exert "final demand" linkages, i.e., linkages to skilled and unskilled labour and thereby to the commodity-sectors producing the commodities demanded by such labour. While as Pack (1981) points out, the development of capital goods in the South can be impeded by inefficient, high-cost production of the inputs to such industries, in the long run the linkages exerted may induce new investment decisions in such industries and/or increased utilization of capacity, either or both of which may raise efficiency in such sectors.

Since none of these dynamic benefits is likely to be realized unless there are both incentives to take advantage of them and pressures to produce efficiently, blanket protection of infant capital goods industries in the South is not the answer. A certain degree of openness to competitive forces must be provided in order that these benefits be realized. The opening up of the South to competition from other Southern producers but not necessarily free of protection from Northern producers may be one mechanism for accomplishing this.

It has long been noticed that technological innovations and dynamic efficiency improvements tend to appear more frequently and to be of greater significance in growing industries than in stagnant or declining ones (see e.g., Schmookler, 1966; Rosenberg, 1968). Whereas the traditional industries which have been at least partially redeployed to the South, such as textiles, leather, and wood products, are declining industries, capital goods industries are of rapidly growing importance in

production,[6/] employment[7/] and trade[8/] in the world as a whole, making it likely that, in the long run at least, there will be more innovation and technical change in capital goods industries than in other industries. Many of these changes are of the learning-by-doing variety which accrue only to those with experience in production.

As pointed out in Section B above, another dynamic factor which, in the short-to-medium term at least, is likely to serve as an obstacle to development of an industry by developing countries, is a high rate of new product creation or product modification. If a certain product-line or subsector of activity is characterized by a rapid rate of product modification and redesign, the greater ability of Northern firms to invest in product modification and design and research and development will make it difficult for Southern producers - even if competitive at one point in time - to remain competitive over time. Shorter production runs will, moreover, tend to decrease utilization rates and hence increase costs. These considerations imply that it may be wise for Southern producers to avoid specialization in product lines characterized by high rates of product modification.[9/] As pointed out in Table B.1 above, this characterization is more typical of certain subsectors within transport equipment ISIC 384 and scientific apparatus ISIC 385 than other subsectors of capital goods.

c) APPROPRIATE TECHNOLOGY

A very severe constraint on industrialization and economic development of the South is the narrowness of the technological choice as to factor proportions and scale of production (sometimes referred to as the technological shelf) that is available to developing countries. The problem that arises from the narrowness of the technological shelf is that there is relatively little room for choice among different technologies,

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6/ See Table C.14 below.

7/ See Table C.15 below.

8/ See Table C.1 below.

9/ See especially UNIDO (1981a, 1981b).

e.g., very little opportunity to substitute the labour which is generally available in abundant supply for capital which is in such scarce supply in most developing countries. Virtually the entire range of technological alternatives for industrial production that is available to developing countries, moreover, is quite inappropriate to the conditions of such countries. The available technology tends to be of such capital-intensity and large scale as to prevent developing countries from industrializing without also increasing unemployment, income inequality and poverty in the process. An important factor contributing to the narrowness of the technological shelf is the overwhelming concentration of capital goods production in the North. Since the share of Southern markets in the North's production of capital goods has (until recently at least) been small, the South has been a mere minor appendage to the market for capital goods produced in the North and designed for the economic conditions of the North. The small size of the capital goods markets in the South, especially at the national level, is hardly sufficient for justifying research and development expenditures (R and D) by such industries to develop capital goods that are more appropriate to conditions of the South.

While it may be relatively difficult and expensive in terms of investment costs to develop an entirely new "alternative" and "appropriate" technology as recent experiments have demonstrated,[10/] smaller scale and more labour-intensive technology may be found relatively easily in the older vintages of capital goods produced in the North. In some cases, of course, the older vintages of capital goods are associated with significantly lower technical efficiency, implying that developing countries would have to sacrifice efficiency in order to utilize smaller scale and more labour-intensive techniques. Naturally, such a sacrifice may not be economically or socially profitable. In other cases, however, the production of older vintages of capital goods in developing countries would make it possible for Southern capital goods industries to provide Southern producers of other goods with capital goods of scale and factor-intensity characteristics appropriate to local conditions quickly and efficiently without requiring costly and time-consuming prior investments in R and D.

10/ See, e.g., the studies reviewed in the special issue of World Development, Vol. 5, No. 10, October, 1977).

Admittedly the data available on the ability of developing country producers to produce capital goods which are at the same time technically efficient and more appropriate to local conditions is quite limited, and that which is available is hardly overwhelming in supporting the ability of Southern producers to produce such goods. One must remember, however, that most of the available data on Southern producers is from comparatively large firms, and, as Mitra (1979) and Pack (1981) suggest, smaller scale producers in developing countries are more likely to adapt technology to local conditions than are either larger producers in developing countries and/or producers in developed countries. In part, this may be explained by dualistic factor markets wherein smaller firms face lower wage-rental ratios than large firms. Small firms are also less likely than large firms to be in a position to afford licensing arrangements whereby Southern firms gain access to foreign technology that is modern and technically efficient but (as suggested above) also quite frequently inappropriate for local conditions. Without such access, small firms may well be forced to innovate with relatively simple technologies. Also, small-scale production affords greater specialization, longer production runs, and fuller utilization of capacity, which (as suggested above) are all factors which tend to raise efficiency and lower unit costs in the production of capital goods in the South.

While it may be difficult for Southern producers to become and remain competitive when a high rate of new product development is required, this should produce considerable success on the part of Southern producers to produce with more labour-intensive techniques and be less dependent on scale economies than their counterparts in the North (Amsden, 1977; Cortes, 1978; Pakistan, 1976; Pack, 1981). Over time, moreover, the ability to change the imported technology to fit local conditions is likely to increase. In view of the importance of the technical efficiency embodied in capital goods for the productive use of such goods in that Southern industry, however, it can hardly be underscored sufficiently Southern capital goods production is likely to remain viable only if it is produced in relatively open economies in which domestic producers are under continuous pressure from foreign competitors to be more efficient.

While traditional trade theory has yielded the implication that developing countries concentrate on primary and other commodities which

are the most labour-intensive, and modern product-cycle theory that they should focus on mature industries, since both types of industries are declining in importance, redeployment of such industries to the South would have to proceed at unrealistically high rates in order for developing countries to gain and hold on to anywhere near adequate shares of world trade and industry. While there may be a statistical association between level of development and shares in world production and trade of relatively young and growing industries, in view of the importance of the learning-by-doing benefits arising from the production of capital goods, any conclusion to the effect that such industries should be allocated to developed countries may be less a logical necessity than an artifact arising from gravitational factors and the lack of experience of the South in capital goods industries. Moreover, if the South would concentrate on producing <u>different</u> capital goods than the North, in particular those with factor proportions and scale which are more appropriate to Southern conditions, it may be much easier for the South to enter and remain competitive at least in <u>Southern</u> markets, than has generally been presumed.

Another factor to be considered in the appropriateness of Southern-produced capital goods for Southern markets is that of income-related quality. There is substantial evidence that the market for capital goods is rather segmented. Northern-produced capital goods are appropriate and suitable for the high-income, high-quality end of the market. But capital goods produced in the South, though cheaper, are often of lower quality and in particular of less durability than those produced in the North, and hence are more appropriate for the low-income and low-quality end of the market.[11/] Naturally, their lower price must more than compensate for their lower quality in order to make them competitive. Nevertheless, at least for those regions of the South where the user's time and also repair and maintenance services are relatively cheap (the principal exceptions at present being the oil-exporting countries of North Africa and the Middle East), lesser durability and greater simplicity are indeed not inappropriate characteristics of capital goods.

11/ See especially Amsden (1977), Mitra (1979), and Agrawal (1981) for detailed demonstrations of this point.

2. Obstacles to the Development of Capital Goods Industries in the South

Some examples of the major impediments to the development of capital goods industries in the South have already been mentioned. First, implicit in the importance of the learning-by-doing benefits of capital goods production is the disadvantage of being a latecomer to the industry. Second, the difficulty of attaining an environment capable of generating innovations on a continuous basis in order to remain competitive with Northern capital goods can hardly be exaggerated. Third, it is not always possible to produce machines more suitable to developing country conditions simply by importing capital goods production lines of older vintage from the North without paying a high cost in terms of lower technical efficiency. Fourth, some capital goods industries are intensive in inputs, such as capital and skilled labour, which are generally in short supply in developing countries. Finally, some capital goods industries are subject to high rates of product modification, requiring firms not only to be in a position to finance substantial R and D expenditures, but also to possess the technical ability to derive productive and profitable results from such experiments. Both of these requirements may pose substantial difficulties for producers in developing countries.

None of these difficulties is, however, fatal or all-pervasive. Indeed, in each case ways of getting around or mitigating these difficulties have also been mentioned. Indeed, as shall be presently pointed out, the means of doing so may well be largely or even completely within the various regions of the South without requiring beneficial actions on the part of the North to carry them out.

The first such difficulty pertains to the structure of relative prices, in general, and of effective protection, in particular. Since individually developing countries are small relative to the rest of the world, domestic prices (for traded goods at least) are generally determined by foreign prices converted into local currency terms by the relevant exchange rate plus the nominal tariff rate on, or the tariff equivalent of existing non-tariff barriers to, such imports. The structure of domestic relative prices is thus determined in large part by the structure of nominal tariff rates (tariff rate equivalents of non-tariff barriers) across the various commodities. Because raw material and intermediate inputs are relatively important in virtually all manufacturing activities (including capital goods industries), profitability

and hence the incentives for domestic production of such goods are also affected by the structure of protection of the commodity inputs. Because of this the concept of the effective rate of protection has been developed so as to take into account both the tariff rates on the finished product and the weighted average of the tariff rates on the various commodity inputs, the weights being the relative shares of such inputs in total production. Given technology and factor efficiency, then it is the effective rate which determines the profitability of domestic value added in a particular industry. Existing studies of effective protection have tended to show that the structure of protection in developing countries is distorted in such a way as to provide extremely high rates of protection for infant-industry finished consumer goods. The corrolary to high rates of effective protection for finished consumer goods production is, however, very low, or even negative rates of effective protection for raw materials and capital goods industries. Low or negative effective rates for capital goods arise because the nominal rates of protection on machinery are generally low whereas those on the intermediate inputs like steel or metal products are high. Even if the nominal rates on capital goods should not be low in the official schedules, in practice they are still likely to be low as a result of the industrial investment incentives that are in effect in most developing countries which grant tariff exemptions on imported machinery to new investment. In some developing countries the relative protection of finished goods production and descrimination against the use of labour and in favour of imported capital are further compounded by discriminatory tariffs and other restrictions against old machinery and old machine-producing machines. The result of such discriminatory trade and exchange rate policies throughout much of the South is that, while the use of capital goods in the South is encouraged, capital goods production in the South is discouraged. These considerations go a long way toward explaining the underdeveloped state of Southern capital goods production and the heavy technological dependence of the South on the North. These same influences, moreover, tend to make equitable, full-employment growth in developing countries difficult to achieve.

A second important additional obstacle to development of capital goods production in the South is the inadequacy in developing countries of activities for financing and servicing such goods. While capital goods producers in developed countries generally have at their disposal mechanisms for financing the purchase of such goods and for servicing and maintaining them, especially

in foreign markets, such mechanisms rarely exist in developing countries. This does not imply that such instruments cannot be created. It does suggest, however, that in order to be able to compete, even in Southern markets, with capital goods produced in the North which are accompanied by means of financing the purchase of such goods, of maintaining them, and of replacing their components, Southern producers must also be able to finance and service their capital goods. These are admittedly no easy tasks.

A third difficulty and one which has already been mentioned is that of arranging for specialization in production so as to take advantage of both a division of labour in the form of long production runs and variations in resource endowments without at the same time leading to underutilization of capacity, a perennial problem in such industries.

It is instructive to note, however, that the resolution of each of these additional problems in no way depends on actions of the North. The South, itself, has the power to overcome or at least to mitigate these difficulties if it really wants to.[12/] To do so, however, may require a considerable amount of co-operation among countries of the South. It is precisely for this reason that South-South co-operation is seen as the sine qua non of effective development of capital goods industries in the South. We proceed to take up the manner in which each of these obstacles can be overcome by South-South co-operation.

The lack of sufficient incentives for domestic production of capital goods in the South (brought about by the low or negative effective rates of protection prevailing in developing countries) can be overcome if and only if such countries are willing to change their structure of protection. In view of the entrenched position of many infant producers of finished consumer goods in developing countries, it may prove politically difficult to reverse the structure of protection so as to reduce the protection to producers of "final" consumer goods and to increase it for producers of capital goods. It could

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12/ As will be discussed below, an exception is the case of the tieing of Northern aid to the purchase of capital goods produced in Northern donor countries.

prove easier to do so within a customs union context wherein domestic politicians could pass the blame for such changes on to the requirements of an integration scheme which would compensate producers of final goods with better marketing possibilities in other Southern regions. As has been noted elsewhere in this report, however, it is very difficult to put together and to maintain over time effective trade agreements of this sort. Hence, attempts to correct the bias against capital goods in this way may not be productive. What may be easier to accomplish, however, especially in a broad South-South co-operation context, is the practice of more realistic exchange rates. These would have the effect of lowering the relative importance of tariffs and other trade restrictions on the structure of relative prices in developing countries, thereby decreasing the degree of discrimination against Southern production of capital goods. Without necessarily getting agreement on both a free trade area and a common external tariff rate for capital goods, the effective size of the market for Southern production of such goods could be increased by producing such goods within multinational companies owned jointly by various nations of the South (MJVs) and getting such countries to treat the output (or even a part thereof) of such enterprises as domestic production which is exempt from duties even if that output is actually generated partly or wholly in another Southern nation. As such exemptions for Southern multinational producers of capital goods would be phased in, the industrial investment incentives on new investment could be phased out (or down), thereby benefitting the Southern producers of capital goods, but without bringing about reductions in government revenues, as is typically the case with customs unions.

With respect to the second obstacle, the lack of a system for financing, maintaining and servicing Southern capital goods deployed throughout the South in a way that would be competitive with Northern producers, MJVs would also seem like an ideal, and probably also unique, vehicle for accomplishing these vitally important functions. Specifically, such capabilities require finance, managerial capability and skilled labour, all of which are unlikely to be available in sufficient supply to any individual national producer. Only by drawing upon skilled labour, management and expertise from the NICs, finance from petroleum and other primary product-exporting countries, and cheap labour from other less favoured developing countries, can all the necessary ingredients of the support for capital goods industries in the South be developed.

Finally, we come to the extremely important problem of accomplishing specialization, long production runs, and the adherance to an agreement wherein MJVs are afforded domestic enterprise status. As has already been pointed out, specialization in production requires co-ordination among different producers, and indeed in the case of the South as a whole, what is more difficult, coordination among producers in many different countries. Moreover, if producers are to be small, as was argued above would tend to be the case for successful capital goods production in the South, the problem of co-ordination is multiplied. Only large TNCs tend to be capable of organizing small developing country producers in this way, and even in such cases the experience has been limited to a relatively few countries (which are particularly suitable for successful sub-contracting) and industries which are simple enough and have sufficiently well-known technologies and markets to make subcontracting viable.13/

Licensing agreements would be an alternative mechanism for allowing for technological flows between regions of the South. The lack of an effective patent system in the South, the lack of information on developing country producers and the greater importance of learning-by-doing embodied in management and skilled workers in capital goods industries, however, all act so as to limit the usefulness of licensing agreements transferring technology from one country to another, and serve to undercore that advantages of MJVs in this context.14/ Arms-length contracts between producers in different countries and especially between different developing countries, in which economic and political conditions are much more volatile than in developed countries, are exceedingly difficult to create, monitor and enforce. By bringing the various producers and agents together within a single profit-seeking enterprise in which all agents share mutual benefits of the successful fulfillment of their individual responsibilities, transactions costs, information costs, and enforcement costs can be reduced to manageable proportions. Otherwise, it would be very difficult to see how Southern producers would be able to take advantage of the aforementioned sizeable benefits of specialization, small scale, full utilization of resources, and resource complementarity that seem essential to a viable capital goods

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13/ See Sharpston (1975)

14/ See Wells (1981)

industry. Moreover, only if the equity capital of such multinational companies of developing countries is widely subscribed to, and the activities of such companies are widely dispersed among countries and regions of the South, will the existence of such companies be seen as equitable. Only if they are regarded as such will countries become and remain willing to treat them as domestic enterprises and hence to serve as an implicit customs union but without the difficulties of arranging and maintaining such a union.

One important obstacle to Southern production and exports of capital goods which cannot be removed by actions of the South alone is that of aid-tieing by the North. An important and perhaps ever-increasing proportion of bilateral official development assistance from the North to the South is in the form of tied-aid wherein recipient countries are required to import the machinery and other components of the development projects supported by the donors from donor country suppliers regardless of the cost of such suppliers. This is an important problem. While in principle, it may be possible for recipient countries to ban tied aid or to agree not to accept it, in practice such aid boycotts are not likely to get very far without the willingness of developed donor countries to co-operate.

3. Potential for Development of Capital Goods Industries

While the general case for both the development of capital goods industries in developing countries on the basis of South-South co-operation and for the role of Southern companies in those processes has been made in the preceeding sections, no indication has yet been given of by how much Southern production might increase or of which types of capital goods. The resolution of these heretofore neglected issues is the purpose of the present section.

In order to achieve these objectives, however, we first require a measure of potential for development of Southern capital goods through intra-South trade and co-operation. As a starting point and as an extreme upper bound estimate of this potential, one might take the total value of imports of the South from the North at the current time or perhaps even that projected to a target year in the future, in this case 1990. Such a measure would be valid, however, only if it were realistic to assume that, on the basis of the South as a whole, it would be possible and economic to substitute for all of the South's current imports from the North. As shown in Table C.1 this measure

Table C.1. Trade in Capital Goods and Total Trade of the North and the South: 1963, 1967, 1970, 1975, and 1978.
(In millions of U.S. Dollars at Current Prices.)

Region of Origin	Region of Destination: NORTH		SOUTH		TOTAL	
	Capital Goods	Total Trade	Capital Goods	Total Trade	Capital Goods	Total Trade
North						
1963	26,531	95,662	9,277	25,186	35,808	120,848
1967	42,997	139,301	12,735	33,721	55,732	173,022
1970	69,770	211,167	18,763	46,546	88,533	257,713
1975	168,312	511,283	66,792	150,496	235,104	661,779
1978	263,318	617,667	99,384	207,219	362,702	824,886
South						
1963	70	25,946	192	7,470	262	33,416
1967	252	33,137	339	9,060	591	42,197
1970	550	45,068	602	12,193	1,152	57,261
1975	2,760	167,794	3,072	51,684	5,832	219,478
1978	6,417	286,934	6,458	99,248	12,875	386,182
Total						
1963	26,601	121,608	9,469	32,656	36,070	154,264
1967	43,249	172,438	13,074	42,781	56,323	215,219
1970	70,320	256,235	19,365	58,739	89,685	314,974
1975	171,072	679,077	69,864	202,180	240,936	881,257
1978	269,735	904,601	105,842	306,467	375,577	1,211,068

Source: UNIDO, unpublished UNITAD model data files, and UNCTAD, Handbook of International Trade and Development Statistics, Supplement 1980.

of the potential increase in production and trade through South-South co-operation would be $99,384 million in 1978 (in current prices). If past trends should continue this value could be assumed to reach $187,680 million (at 1978 prices) by 1990. The corresponding value for overall imports of the South from the North (at 1978 prices) in 1990 would be approximately $490,000 million, thereby indicating that capital goods imports would constitute almost 40 per cent of total imports of the South from the North. Considering that capital goods are far from homogenous and that the easiest steps in import substitution have already been taken, each additional step in the direction of import substitution can be considered likely to increase the capital, skill, experience and research and development requirements. This would make it extremely unlikely that all imports of capital goods from the North could be substituted for by production in the South. Hence, this measure undoubtedly vastly overestimates the realistic potential for development of capital goods via South-South co-operation by the year 1990.

As an alternative measure of potential for future South-South trade Yeats (1981, Chapter 3) suggested the minimum of two values, one being the same measure, i.e., the value of Southern imports from the North, and the other, the value of Northern imports from the South. On the assumption that the South should consider exporting - even to South - only those commodities which are labour-intensive, he also restricted his attention to those sectors which had been identified in previous studies as relatively labour-intensive. To identify the candidate subsectors and relevant magnitudes, he applied his suggested criterion to a list of labour-intensive manufacturing industries at the five-digit level SITC. The results for capital goods only are shown in Table C.2. By constraining the aforementioned first measure of potential for increased South-South trade in two ways, namely, by focussing only on labour-intensive products and by limiting the magnitude to the amount exported by the South to the North, Yeats' measure is undoubtedly a very conservative and restrictive one. Notice that the aggregate total of potential South-South trade in capital goods estimated by this method is only $2718 million (at 1975 prices) or 2% of the total potential South-South trade in manufacturing sectors which he identified. Even after adjusting for the difference between 1975 and 1978 prices this estimate, moreover, is considerably less than 2 per cent of the total potential estimated above by the first (single-criterion) measure.

Table C.2. Yeats' Measure of Potential South-South Trade in Capital Goods Based on 1975 Prices. (In Millions of U.S. Dollars.)

SITC Rev.1	Commodity Class	1975 Imports of OECD Countries from LDCs	1975 Imports of LDCs. from OECD Countries	Per cent LDC Exports Diverted	Per cent OECD Exports Replaced	Potential LDC Intra-Trade
695	Hand Tools	68	70	1.00	0.10	68
712	Agricultural Machinery	18	2,137	1.00	0.01	18
714.2	Calculating Machines	273	253	0.93	1.00	253
714.3	Statistical Machines	88	484	1.00	0.18	88
714.9	Office Machines	160	561	1.00	0.29	160
715.1	Metal Working Machines	23	2,245	1.00	0.01	23
715.2	Other Metal Working Machines	2	679	1.00	0.00	2
717.1	Textile Machines	11	2,666	1.00	0.00	11
717.3	Sewing Machines	31	267	1.00	0.12	31
718.1	Paper Mill Machines	3	450	1.00	0.01	3
718.8	Food Processing Machines	3	533	1.00	0.01	3
719.2	Pumps	50	2,821	1.00	0.02	50
719.5	Power Tools,n.e.s	16	982	1.00	0.02	16
719.6	Other Non-electric Machines	15	949	1.00	0.02	15
719.8	Machinery, n.e.s.	24	2,762	1.00	0.01	24
719.91	Moulding Boxes	3	149	1.00	0.02	3
719.92	Taps and Values	2	1,263	1.00	0.00	2
722.	Electric Power Machines	303	3,404	1.00	0.09	303
729.1	Batteries and Accumulators	24	242	1.00	0.10	24
720.2	Electric Lamps	66	128	1.00	0.51	66
729.3	Themionic Valves	976	1,151	1.00	0.85	976
729.4	Automotive Electrical Equip.	31	319	1.00	0.10	31
729.9	Electrical Machinery, n.e.s.	213	1,487	1.00	0.36	213
731	Railway Vehicles	6	852	1.00	0.01	6
732.8	Motor Vehicle Bodies	180	3,543	1.00	0.05	180
732.9	Motorcycles and Parts	8	463	1.00	0.02	8
861.2	Spectacles and Frames	21	69	1.00	0.32	22
861.3	Optical Goods	12	15	1.00	0.76	12

Table C.2. Continued.

861.4 Photographic Cameras	89	144	1.00	0.62	89
861.6 Photographic Equipment	18	246	1.00	0.07	18
Total	2,737	31,335			2,718
Total Projected Increase					119,555
Percent Total	2%	26%			2%

Source: A.Y.Yeats 1981, Table 3.6. (pp.48-51)

While the former measure of potential for South-South trade, namely total imports of the South from the North, undoubtedly greatly overstates the realistic potential for growth in South-South trade and production, by limiting the estimated magnitude of such potential, in the first instance, to labour-intensive products and, in the second, to that which the South already exports to the North and hence which could presumably be diverted to the South, Yeats' measure undoubtedly greatly understates such potential.

It has been argued in the preceeding sections that factor-intensity should not be such an important consideration in choosing the specific types of capital goods that should be produced and the magnitude of such production in the South for export to the South. Moreover, as emphasized in Section B above, the fact that even when a certain factor which is intensively used in the production of a particular type of capital good is not available in a specific region of the South, generally it is available within the South as a whole. Hence, it should be possible to achieve the necessary amount of factor accumulation, mobility and complementarity of production of capital goods if done on the basis of a comprehensive programme of co-operation within the South.

Referring back to Table B.1 above, it may be seen that the capital goods industries are relatively low in energy and physical capital-intensity but relatively high in human capital-intensity. While some regions of the South, such as Tropical Africa and North Africa - Middle East, may be extremely short in

supplies of skilled labour and management, other regions of the South and even certain countries within those regions, such as Egypt and Lebanon, but especially India, Korea, and other East Asian countries and the more developed countries of Latin America, have relatively plentiful supplies of such scarce factors of production, making South-South co-operation a desirable and even necessary vehicle for the successful development of capital goods industries within the South. Finally, based on the especially high shares of Southern imports from the North in apparent consumption of the South for the capital goods industries revealed in the last column of the table, it is clear that the quantitative potential for global import substitution via South-South co-operation in the South as a whole is considerably greater in these industries than in any other industry.

Although it has been argued above that the demonstration of the ability to export to the North and labour-intensity may be overly restrictive criteria with which to identify potential for development on the basis of South-South co-operation, because of the importance of dynamic factors like market creation and growth, and learning-by-doing in the development of such industries, we deem it appropriate to insist not only on a relatively low rate of new product development but also on at least above-average rates of growth in the South of both real value added and exports in these industries. Only if both the rate of new product development is relatively low and some signs of dynamism of Southern production and exports can be detected would it seem reasonable to attach high priority to development and South-South co-operation of the more promising subsectors of capital goods.

Basic data on real value added in each subsector of capital goods by region for various years between 1963 and 1979 are given in Table C.3. As can be seen from the growth rates derived from this data and presented in Table C.4, the rates of growth during the period 1963-79 of real value added in the Southern capital goods industry as a whole of 8.9 per cent per annum, of growth of 10.9 per cent per annum in the non-electrical machinery sector and 10.8 per cent per annum in the electric machinery sector have indeed been highly satisfactory. Moreover, they are considerably larger than those of the North and of the world in the capital goods industries themselves and those of either the North or the South in all industries other than basic goods (whose growth rate in the South has been about equal to that of capital goods). Above-average rates of growth have also been observed in each of the three most relevant and important ISIC

Table C.3. Value Added of Capital Goods and Subsectors thereof by Region and Year. (In millions of U.S. Dollars of 1975 Prices.)

	Non Electric Machinery	Electric Machinery	Transport Equipment	Professional and Scientific Equipment	Other Capital Goods	Total
	382	383	384	385	390	0
Latin America						
1963	1,176	1,477	2,084	172	437	5,346
1967	1,974	2,378	3,056	270	616	8,294
1970	2,496	3,238	4,463	328	765	11,290
1975	5,547	4,694	7,696	544	1,093	19,574
1977	5,932	5,443	7,737	577	1,090	20,779
1979	6,861	6,544	9,286	600	1,216	24,507
Tropical Africa						
1963	30	55	122	1	46	254
1967	44	75	133	1	66	319
1970	57	104	182	2	93	438
1975	82	142	271	3	154	652
1977	67	154	524	2	84	831
1979	67	176	206	2	80	531
North Africa-Middle East						
1963	76	74	80	2	16	248
1967	78	134	130	5	40	387
1970	106	207	230	4	46	593
1975	302	610	562	5	89	1,568
1977	387	699	668	5	103	1,862
1979	441	807	691	n.a.	95	1,934
South Asia						
1963	316	281	722	31	668	2,018
1967	549	434	648	37	870	2,538
1970	716	662	615	49	582	2,624
1975	917	784	705	76	675	3,157
1977	1,083	918	780	91	825	3,697
1979	1,229	1,019	798	128	n.a.	3,174
East Asia						
1963	104	206	324	31	182	847
1967	155	320	359	49	233	1,116
1970	193	531	468	63	228	1,483
1975	445	1,206	1,044	166	336	3,197
1977	592	2,193	1,254	288	461	4,788
1979	885	3,314	1,720	363	429	6,711

Table C.3. continued.

Total South						
1963	1,702	2,093	3,332	237	1,349	8,713
1967	2,800	3,341	4,326	362	1,825	12,654
1970	3,568	4,742	5,958	446	1,717	16,431
1975	7,293	7,438	10,281	794	2,357	28,163
1977	8,061	9,407	10,963	963	2,573	31,967
1979	9,483	11,860	12,601	1,093	1,831*	36,868*
Total World						
1963	81,714	53,887	78,006	18,685	14,883	247,175
1967	108,415	75,195	100,601	26,543	19,213	329,967
1970	136,225	100,454	119,579	33,971	22,501	412,730
1975	166,521	128,898	150,666	47,543	28,878	522,500
1977	185,736	154,301	174,908	57,025	33,832	605,802
1979	209,721	177,728	191,230	65,865	36,314*	680,858*

Source: UNIDO data base; information supplied by the statistical office of the United Nations with estimates by the UNIDO Secretariat.

* Indicates incomplete data.

categories, i.e., ISIC 382, 383 and 384 in the Latin America, North Africa - Middle East, and East Asia regions. South Asia and East Asia have also enjoyed rapid growth in ISIC 385 and the North Africa - Middle East region has had above-average growth in the relatively heterogeneous ISIC 390. The ommission of the North Africa - Middle East region, moreover, from the above-average category in the other subsectors of capital goods is rather directly attributable to the troubled circumstances and aftermath of the Iranian Revolution.

Tables C.5 and C.6 present the two-by-two (North-South) trade matrices for each subsector of capital goods by two-digit SITC for the years 1970, 1975 and 1977. Table C.5 contains the trade flows in current prices while Table C.6 contains the corresponding information based on data at constant prices of 1975. Note how consistently the figures for the Southern rows in these tables have been rising over time. Indeed, from the growth rates in real terms computed from Table C.6 for the period 1970-77 and which are presented in Table C.7, it can be seen that exports in all sectors of capital goods from the North, from the world as a whole, but especially from the South, have been growing extremely rapidly.

Table C.4. Growth Rates of Real Value Added of Capital Goods Industries by Region of the South and the World.

Region Time Period	Non-Electric Machinery 382	Electric Machinery 383	Transport Equipment 384	Professional and Scientific Equipment 385	Other Capital Goods 390	Total Capital Goods 0
Latin America						
1963-1979	12.48	10.43	10.47	8.69	7.06	10.68
1970-1977	15.52	9.04	9.60	9.87	6.08	10.70
Tropical Africa						
1963-1979	5.50	8.06	3.55	4.73	3.76	5.04
1970-1977	2.73	6.76	19.27	0.0	-1.68	11.26
North Africa - Middle East						
1963-1979	12.44	17.27	14.26	-	12.61	14.67
1970-1977	24.09	22.49	19.45	3.79	14.38	21.01
South Asia						
1963-1979	9.48	8.97	0.67	9.91	-	3.07
1970-1077	7.14	5.60	4.04	10.87	5.99	5.88
East Asia						
1963-1979	15.34	20.35	11.77	17.82	5.88	14.80
1970-1977	20.54	26.67	17.85	28.83	12.45	21.57
South						
1963-1979	10.7	10.8	8.2	9.4	1.8	8.9
1970-1977	10.7	8.9	7.9	10.1	5.2	8.7
World						
1963-1979	6.49	8.28	6.16	8.76	6.13	6.99
1970-1977	5.30	7.12	6.54	9.02	7.03	6.60

Source: UNIDO data base; information supplied by the statistical office of the United Nations with estimates by the UNIDO Secretariat.

Table C.5. Two-by-Two Trade Matrices at Current Prices for Subsectors of Capital Goods for 1970, 1975 and 1977.

SITC: 71 Non Electric Machinery.

	1970 Destination			1975 Destination			1977 Destination		
Origin	North	South	World	North	South	World	North	South	World
North	28,152	8,643	36,795	73,736	29,965	103,700	88,831	38,065	126,896
South	208	324	532	1,209	1,485	2,693	2,560	2,066	4,627
World	28,360	8,967	37,327	74,945	31,449	106,394	91,391	40,132	131,523

SITC: 72 Electrical Machinery.

Origin	North	South	World	North	South	World	North	South	World
North	13,188	3,971	17,159	33,295	13,312	46,607	45,211	21,088	66,299
South	598	206	884	3,057	1,267	4,324	5,419	2,324	7,743
World	13,786	4,177	17,963	36,352	14,579	50,931	50,630	23,412	74,042

SITC: 73 Transport Equipment.

Origin	North	South	World	North	South	World	North	South	World
North	25,967	7,298	33,264	63,924	29,924	93,848	89,206	35,869	125,075
South	134	230	364	771	1,855	2,626	1,179	2,923	4,102
World	26,101	7,527	33,628	64,695	31,779	96,474	90,384	38,792	129,177

SITC: 86 Scientific Machinery, etc.

Origin	North	South	World	North	South	World	North	South	World
North	4,817	1,211	6,028	11,903	3,139	15,043	15,851	4,544	20,395
South	89	71	160	624	352	976	1,072	646	1,718
World	4,905	1,282	6,188	12,527	3,492	16,019	16,924	5,189	22,113

Source: United Nations Statistical Office, with estimates by UNIDO Secretariat.

Table C.6. Two-by-Two Trade Matrices for Capital Goods and Subsectors Thereof for 1970 and 1977 at Prices of 1975.

Commodity Class	Region of Origin	1970 Region of Destination North	1970 South	1970 Total	1977 North	1977 South	1977 Total
SITC: 71	North	44,686	13,719	58,405	79,313	33,987	113,300
Non-Electric	South	347	540	887	1,954	1,577	3,522
Machinery	Total	45,033	14,259	59,292	81,267	35,564	116,832
SITC: 72	North	20,933	6,303	27,237	40,367	18,829	59,196
Electric	South	997	343	1,340	4,137	1,774	5,911
Machinery	Total	21,930	6,646	28,577	44,504	20,603	65,107
SITC: 73	North	41,217	11,584	52,800	79,648	32,026	11,674
Transport	South	223	383	607	900	2,231	3,131
Equipment	Total	41,440	11,967	53,407	80,548	34,257	114,805
SITC: 86	North	7,646	1,922	9,568	14,153	4,057	18,210
Scientific	South	148	118	267	818	493	1,311
Equipment	Total	7,794	2,040	9,835	14,971	4,550	19,521
Total	North	131,865	36,400	168,265	205,388	77,520	282,908
	South	1,145	1,120	2,265	5,005	5,037	10,043
	Total	133,010	37,520	190,530	210,393	82,557	292,950

Source: United Nations Statistical Office, with estimates from UNIDO Secretariat.

Note: Data pertains to the year 1978.

Exports of capital goods as a whole by the South have been growing at almost 20 per cent per annum and those of electric machinery, transport equipment and scientific equipment have been growing at rates over 20 per cent per annum. In the case of non-electric machinery and scientific equipment, Southern exports to the North have been growing more rapidly than those to the South but in the other subsectors and overall, the rates of growth of Southern exports to the South have exceeded those of Southern exports to the North.

The above-average growth rates of Southern production and exports of capital goods in general, and of the three more promising subsectors thereof in particular, namely, non-electric machinery (ISIC 382), electric machinery (ISIC 383) and transport equipment (ISIC 384), imply that the shares of the South in production and exports of these increasingly important commodity - sectors must be rising. The validity of such an implication is confirmed by the results presented in Table C.8.

Part A of Table C.8 shows that the shares of developing countries in world value added of non-electric machinery, electric machinery and transport equipment have exhibited impressive increases, especially during the 1970s. Note, for example, that the South's share of world value added of non-electric machinery increased from 2.62 per cent in 1970 to 4.52 per cent in 1979. Likewise, the corresponding shares of the South in electric machinery and transport equipment increased from 4.72 per cent to 6.67 per cent, and from 4.98 per cent to 6.59 per cent, respectively, between 1970 and 1979.

From Part B of Table C.8 it can be seen that the shares of the South in world exports of capital goods increased from 2.00 per cent to 3.43 per cent between 1970 and 1978. Between 1970 and 1977 those of non-electric machinery increased from 1.4 per cent to 3.5 per cent, those of electric machinery from 4.5 per cent to 10.5 per cent, and those of transport equipment from 1.1 per cent to 3.2 per cent.

In Part C of the table it can be seen that the proportion of the South's imports of capital goods that are imported from the South also increased sharply between 1970 and 1977. Finally Part D of Table C.8 indicates that the shares of exports of capital goods by the different Southern regions going to other Southern regions has generally remained quite high - over 40 per cent overall - and is particularly high in non-electric machinery and transport

Table C.7. Growth Rates of Real Exports of Capital Goods and Subsectors Thereof of the North, the South and the World for the Period 1970-77.

SITC: 71 Non-Electric Machinery

	North	South	World
North	7.44	12.01	8.64
South	24.12	14.34	18.85
World	7.66	12.10	8.85

SITC: 72 Electric Machinery

	North	South	World
North	8.55	14.66	10.19
South	19.47	22.80	20.38
World	9.25	15.19	10.84

SITC: 73 Transport Equipment

	North	South	World
North	8.58	13.55	25.96
South	19.05	24.6	22.75
World	8.66	14.05	10.04

SITC: 86 Scientific Equipment, Etc.

	North	South	World
North	8.00	9.79	8.38
South	23.83	19.57	22.01
World	8.50	10.55	8.95

Total Capital Goods. 1/

	North	South	World
North	7.99	12.67	8.88
South	19.61	11.98	17.79
Total	8.17	13.06	6.13

Source: United Nations Statistical Office, with estimates from UNIDO Secretariat.

1/ These growth rates are for the period 1970-78.

Table C.8. Shares of the South in World Value Added, Exports and Imports of Capital Goods and Subsectors thereof. (In per cent.)

A. Shares in World Value Added

Year	382 Non-electric Machinery	383 Electric Machinery	384 Transport Equipment	385 Scientific Instruments	390 Other Machinery	Total
1963	2.08	3.88	4.27	1.27	9.06	3.53
1967	2.58	4.44	4.30	1.36	9.50	3.83
1970	2.62	4.72	4.98	1.31	7.63	3.98
1975	4.38	5.77	6.82	1.67	8.16	5.39
1977	4.34	6.10	6.27	1.69	7.61	5.28
1979	4.52	6.67	6.59	1.66	5.04	5.41

B. Shares in World Exports

Year	71 Non-Electric Machinery	72 Electric Machinery	73 Transport Equipment	86 Scientific Instruments	Other Machinery	Total
1970	1.40	4.50	1.10	1.6	-	2.00
1975	1.60	8.4	4.1	5.80	-	2.71
1977	3.50	10.50	3.20	7.80	-	3.32
1978	-	-	-	-	-	3.43

C. Shares in Southern Imports

Year	71 Non-Electric Machinery	72 Electric Machinery	73 Transport Equipment	86 Scientific Instruments	Other Machinery	Total
1970	3.60	4.90	3.00	5.50	-	3.50
1975	4.70	8.70	2.4	13.0	-	4.74
1977	5.10	9.90	7.50	12.40	-	6.40
1978	-	-	-	-	-	6.53

Table C.8. continued.

D. Shares in Southern Exports

Year	71 Non-Electric Machinery	72 Electric Machinery	73 Transport Equipment	86 Scientific Instruments	Other Machinery	Total
1970	60.9	25.6	63.2	44.4	-	44.7
1975	55.1	29.3	41.6	36.1	-	43.8
1977	44.7	30.0	71.3	37.6	-	43.8

Source: UNIDO data base information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

equipment. While the corresponding share is relatively low in the electric machinery subsector, it has been rising over time so that by 1977 it was 30 per cent.[16/]

While the growth rates of capital goods production and of exports of developing countries, in general, and the increases in their shares of world production and exports over the last decade or two have been impressive, it would be quite misleading to leave the impression that these gains have been spread evenly throughout the South. Indeed, quite the opposite is the case; Southern capital goods production and exports have been and remain highly concentrated as is revealed in Table C.9.

We refer first to the regional shares in Southern value added. On the one hand, approximately two-thirds of the South's value added of capital goods in 1979 was provided by Latin America, whereas the corresponding proportion contributed by the Tropical Africa and North Africa-Middle East regions combined was less than 7 per cent. The only significant changes in the value

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16/ The real growth in South-South trade may be somewhat overestimated from this data since such data includes intrafirm sales and transfers from one country to another which are sometimes thought to be quite important. Unfortunately, the data required for distinguishing such flows from true South-South flows is not available.

added shares have been the abrupt decline in South Asia's share in Southern value added from 23.2 per cent in 1963 to 16 per cent in 1970 and to 8.6 per cent in 1979 and the equally sharp rise of East Asia's from 9 per cent in 1970 to 18.2 per cent in 1979.

From the regional shares of the various subsectors of Southern capital goods production which are also given in Table C.9, it can be seen that there are moderate deviations from the overall pattern from one subsector to another. For example, for the electric machinery subsector the Latin American share in Southern value added has been falling slightly and the corresponding rise in the East Asian share has been especially great, rising from 11 per cent in 1970 to 28 per cent in 1980. On the other hand, the Latin American shares have been particularly buoyant and the corresponding increases in the East Asian shares have been considerably smaller in the case of the non-electric machinery and transport equipment subsectors.

With respect to export shares, the dominance of Latin America is considerably diminished and generally declining but this is offset by a much larger and rising share of East Asia. The difference between the regional production and regional export shares is indicative of the striking difference in the degree of outward orientation between Latin America (low) and East Asia (high).

Indeed, the degree of concentration in production and trade is sufficiently great that it is not entirely meaningful to describe the experience and performance in terms of regions. According to UNIDO (1979), more than 60 per cent of the South's exports of capital goods was provided by only five developing countries and more than 85 per cent by 10 countries.

Moreover, since it is somewhat easier to bring country data up to date than it is regional data, it is useful to supplement our analysis of regions with some more recent capital goods export data pertaining to some of the more important capital goods exporting countries. This is done in Tables C.10 and C.11. The informer includes data for 1980 while the latter contains data for 1975 and 1978.

Table C.9. Shares of the Different Regions of Developing Countries in the Value Added and Exports of Capital Goods and Subsectors thereof of the South as a Whole (in per cent).

Region	Non-Electric Machinery		Electric Machinery		Transport Equipment		Total	
Year	Value Added ISIC 382	Exports SITC 71	Value Added ISIC 383	Exports SITC 72	Value Added ISIC 384	Export SITC 73	Value Added	Exports
Latin America								
1963	69		71		63		61	
1970	70	39	68	21	75	26	70	31
1975	76	36	63	23	75	30	70	30
1977	74	28	58	18	71	29	65	25
1979	72		55		74		66	
Tropical Africa								
1963	2		3		4		3	
1970	2	3	2	1	3	10	3	4
1975	1	2	2	1	3	7	2	2
1977	1	1	2	1	5	2	3	0.5
1979	1		1		2		1	
North Africa-Middle East								
1963	4		4		2		3	
1970	3	8	4	2	4	10	4	9
1975	4	11	8	4	5	26	6	7
1977	5	9	7	5	6	20	6	6
1979	5		7		5		5	
South Asia								
1963	19		13		22		23	
1970	20	8	14	3	10	12	16	10
1975	13	6	11	2	7	4	11	6
1977	13	4	10	2	7	6	12	5
1979	13		9		6		9	
East Asia								
1963	6		10		10		10	
1970	5	23	11	43	8	24	8	40
1975	6	28	16	47	10	19	11	53
1977	7	20	23	51	11	30	15	60
1979	9		28		14		18	
Centrally Planned Asia 1/								
1970	-	5	-	2	-	7	-	
1975	-	4	-	2	-	6	-	
1977	-	3	-	2	-	2	-	

1/ Value Added data not available for Centrally Planned Asia.

Source: Value Added: Computed from data in Table 4;
Trade: Computed from data from United Nations Statistical Office with estimates by UNIDO Secretariat.

The data presented in Table C.10 confirm the validity of the aforementioned overall conclusion of extremely rapid growth in the Southern exports of capital goods during the decade of the 1970s. Indeed, the value of exports of capital goods evaluated in U.S. dollars at current prices in the countries included in the table increased almost ten-fold over the period. The growth rates of capital goods exports of Brazil, Colombia, Malaysia, Korea, and Singapore all exceeded that of the sample as a whole while those of Argentina, Hong Kong, India, Ivory Coast, Trinidad and Tobago, Yugoslavia[17/] and especially Mexico lagged somewhat behind the overall average of the sample. In no case, however, did the value of such exports rise by less than 95 per cent over the decade. Note also that the rate of growth of capital goods exports of the countries included in the table exceeded the growth rate of their total exports in the period 1975-80 by considerably more than in the 1970-75 period, indicative of the rapidly rising relative importance of capital goods exports for Southern producers of such goods.

As to the direction of Southern exports of capital goods, from Table C.11 it can be seen that there are two rather distinct patterns. The dominant pattern, exemplified especially by the South American and South Asian countries, is that of heavy concentration on exports to the South. Note that this proportion is some 60 per cent or more in capital goods as a whole in Brazil, Colombia, and India. The other and more recent pattern is that displayed primarily by East Asian producers, such as Hong Kong, Korea and Singapore, and also to a lesser extent by Mexico, wherein well over half of their exports go to the North. In the latter case, sub-contracting (in many cases co-ordinated by large TNCs) plays an important role in such exports. The degree of specialization of individual countries in different product lines and segments of the markets for these capital goods, moreover, is sufficiently great that the proportion of exports directed to the South by any given Southern exporter can also vary considerably from one type of capital good to another.[18/]

17/ Yugoslavia is sometimes not included as a developing country and indeed in this study is included with Western Europe rather than in any developing region.

18/ See especially Amsden (1977) and Mitra (1979).

Table C.10 Value and Growth of Exports of Capital Goods from Developing Countries 1970, 1975 and 1980.

Exporting Countries and Territories	Value of Capital Goods[1] Exported (US$ Million)			Average Annual Rate of Export Growth (Percent)				Share of Capital Goods in Total Exports (Per cent)	
				Capital Goods		Total Exports			
	1970	1975	1980	1970-75	1975-80	1970-75	1975-80	1970	1980
Argentina	69.7	422.6	504.8	43.4	9.3	10.8	38.0	3.9	8.9[d]
Brazil	63.3[b]	921.6	3,496.7	56.3	30.6	24.7	18.4	2.7	17.4
Colombia	6.3	35.7	70.1[d]	41.5	40.1	15.1	29.1	0.9	2.9[d]
Hong Kong	244.6	683.8	1,792.4	22.8	21.2	17.8	24.3	12.0	13.1
India	84.0[b]	356.0	452.9[d]	27.2	12.8	15.6	17.2	4.6[b]	7.6[d]
Indonesia	3.6	33.8	40.5[a]	56.6	3.7	46.5	25.2	0.3	0.2[a]
Iran	2.1[b]	43.3	-	65.6	-	43.3	-	0.0[b]	-
Ivory Coast	8.4	26.0[c]	56.5[a]	32.6	16.8	26.9	15.6	1.8	2.2[a]
Kuwait	22.2	111.9[c]	286.6[d]	49.8	288.9	54.9	11.0	1.2	2.9[d]
Malaysia	29.5	246.1	417.7[d]	93.4	30.3	17.9	25.7	1.7	6.9[d]
Mexico	132.5	287.3	263.6[d]	16.7	-4.2	19.9	13.9	11.0	6.3[d]
Pakistan	3.4	7.0	35.6	15.5	38.4	8.2	20.0	0.4	1.4
Rep. of Korea	60.8	712.2	2,080.9	63.6	23.9	43.6	28.0	7.3	11.9
Singapore	181.6	1,374.7	2,765.4	49.9	33.2	28.2	29.2	11.7	14.3
Thailand	.5[b]	21.7[c]	176.8[a]	256.6	52.1	52.9	16.5	0.0[b]	3.4[a]
Trinidad and Tobago	6.5	14.2	32.9[e]	16.9	5.8	29.8	10.2	1.3	0.7[a]
Yugoslavia	404.7	1,427.5	2,943.3[a]	28.7	19.8	19.4	19.0	24.1	30.3[a]
TOTAL	1,591.0	5,725.4	15,401.6	29.2	21.9	30.4	10.7	6.9	10.7

a = 1979
b = 1969
c = 1974
d = 1977
e = 1978

Source: Computed from UN Commodity Trade Statistics (various issues)

TABLE C.11. EXPORTS OF CAPITAL GOODS BY SELECTED SOUTHERN EXPORTERS BY TYPE AND BY DESTINATION
(millions of US Dollars f.o.b.)

EXPORTS OF CAPITAL GOODS		BRAZIL				COLOMBIA				HONG KONG				INDIA				REPUBLIC OF KOREA				MEXICO				SINGAPORE			
SITC Code	Commodity	Export Value 1975 $	Export Value 1978 $	South Share 1975 %	South Share 1978 %	Export Value 1975 $	Export Value 1978 $	South Share 1975 %	South Share 1978 %	Export Value 1975 $	Export Value 1978 $	South Share 1975 %	South Share 1978 %	Export Value 1975 $	Export Value 1978 $	South Share 1975 %	South Share 1978 %	Export Value 1975 $	Export Value 1978 $	South Share 1975 %	South Share 1978 %	Export Value 1975[1] $	Export Value 1978 $	South Share 1975[1] %	South Share 1978 %	Export Value 1975 $	Export Value 1978 $	South Share 1975 %	South Share 1978 %
7	Total machinery and transport equipment	896.2	1939.3	65.2	58.7	32.2	65.5	86.6	84.8	672.1	1330.2	17.9	19.1	317.5	458.2	76.3	77.5	700.7	2570	24	31	285.4	611.3	33.2	32	1220	2519.7	44.8	44.2
71	Total machinery non-electric	425.8	845.5	59.9	52.7	18.5	33.5	93.5	94	98.2	292.2	26.3	17.9	134.1	195.4	77.2	76.6	76.3	201.3	15.9	36.5	109	242.3	43.7	31.6	375	572.9	51.5	60.5
72	Electrical machinery	171.8	346.5	47.6	33.3	6.7	11.2	97	91.1	562.2	1026.4	15.5	19.7	76.8	108.7	66.4	67.3	440.9	1247.6	12.5	18.5	43.8	87.1	57.8	69.6	620.4	1568.4	61.1	32.3
73	Transport Equipment	298.6	747.4	82.9	77.1	7.1	21.1	57.7	65.4	11.7	11.4	59	5.2	106.6	154	82.6	85.8	183.6	1121.1	55.1	44	132.6	130.2	16.5	20.6	224.6	378.4	59.3	68.7
711.4	Aircraft Engines	18.2	77.2	24.7	23.6	—	0.1	—	—	—	—	—	—	—	0.3	—	33.3	0.2	3.4	50	14.7	—	—	—	—	33.3	28.5	3.6	13
711.5	Other internal combustion engines	91.1	219.3	23.9	14.6	0.7	2.2	100	100	—	8.9	—	77.5	32.9	43	41.3	62.1	2	7.4	80	68.9	32.7	113.3	30.3	20.7	20.0	50.2	84	78.1
712	Agricultural machinery	33.2	98.4	97.0	77.5	1.5	3.4	93.3	100	—	—	—	—	3.8	5.8	94.7	87.9	0.8	2.3	12.5	60.9	2.8	6.1	42.9	67.2	4.2	4.3	90.5	90.7
714	Office machinery	109.3	129.2	45.7	50	1.4	1.2	100	100	70.8	237.1	5.1	4.1	6.2	1.9	29	68.4	44.1	69.6	1.6	5.7	19.1	30.8	82.2	81.2	87.5	82.7	15.4	16.3
715	Metal-working machinery	15.4	21.3	96.1	85.4	1.6	1.9	100	100	3.3	4.4	97	93.2	8.4	16.3	38.1	53.4	0.9	3.9	22.2	43.6	—	1.1	—	81.8	6.9	20.1	71	42.8
717	Textile and leather machinery	23	35.3	67.8	65.4	1.6	2.7	100	92.6	6.7	6.8	91	94.1	33.6	15.3	94.9	83.7	10.5	26.9	16.2	39.8	3.8	2.7	63.2	51.9	8.1	13.4	92.6	85.8
718	Special industrial machinery	46.8	85.7	88.7	95.1	1.4	3.9	64.3	92.3	0.9	1.3	77.8	84.6	9.9	22.5	98	94.7	3.7	24.9	73	89.6	2.3	10.1	52.2	41.6	96.4	121.7	64.4	86.2
719	Other special machinery	83.7	177.3	83.4	78.5	9.5	15	94.7	92	16.5	33.8	62.4	40.8	37.4	66.6	77.8	75.7	13.8	49.3	24.6	54.2	47.7	61.3	38.4	28.2	113.2	246	69.1	63.9
722	Electrical power machinery	34	48.1	78.2	63.4	1.7	4.4	100	95.5	6.6	38.6	25.8	22.3	20.8	39.1	90.9	94.4	40.4	80.8	12.9	21	10.7	13.4	25.2	64.9	54.1	115.4	36.6	36.9
723	Equipment for distributing electricity	5.2	7.4	57.7	74.3	1.1	3.2	100	78.1	1.7	4.7	82.4	93.6	21.1	21.2	28.9	44.8	16.9	45.8	81.7	91.7	5.1	9.7	76.5	36.1	5.1	11.1	92.2	90.1
724	Telecommunications apparatus	63.7	131.6	21.2	15.8	0.5	0.1	100	100	299.5	552	17.1	16.1	9.7	7.9	70.1	43	138	611.5	5.6	10.5	18.8	5	68.1	46	168.8	468.1	17.7	28.9
725	Domestic electrical equipment	14.3	22.8	93.7	96.9	2.2	2.4	100	100	56.6	166.8	23.7	20.3	9.8	11.4	91.8	86	3.2	21.8	0	33.5	1	5.1	90	49	14.7	50.9	46.9	44.2
726	Medical Apparatus	0.2	0.5	100	100	—	—	—	—	—	—	—	—	0.5	0.4	60	75	0.2	1.1	0	0	—	0.1	—	0	2.8	2.8	7.1	28.6
729	Electrical machinery, other	54.5	136	45.5	26.8	1.2	1.1	91.7	100	197.8	264.3	9.9	25	14.9	28.7	45	44.9	242.2	486.6	11.6	20.7	8.3	53.8	59	81.2	374.8	920.1	42.3	35.4
731	Railway Vehicles	5.7	25.2	96.5	86.5	—	—	—	—	—	—	—	—	20.8	5.2	55.3	90.4	20.5	89.9	13.2	11.1	0.3	11.4	0	0.9	0.3	0.5	100	80
732	Road Motor Vehicles	272.1	551.6	82.9	78.9	5.6	14.5	48.2	57.2	0.3	0.2	0	0	52.3	100.8	88.1	92.2	3.4	79.4	44.1	77.5	115.1	256.2	17.2	20.4	80.4	145.3	94.4	92.6
733	Road Vehicles other than motor	6.6	19.9	87.9	91.5	0.3	5	100	100	0.8	1.4	0	21.4	29.7	37.7	93.6	86.2	7.7	18.3	6.5	6	1.8	2.1	5.6	33.3	3	8.6	56.7	45.3
734	Aircraft	10.3	35.9	75.7	49.3	0.8	1.3	100	23.1	—	—	—	—	1.1	0.1	0	0	14.3	133.3	0.7	2.7	12.9	7.5	1.6	6.7	10.7	42.9	76.6	56.6
735	Ships and Boats	3.9	114.8	71.8	72.4	0.3	0.2	100	100	10.5	10	65.7	3	2.7	10.2	96.3	18.6	137.8	800.2	69.9	51.1	2.5	4.7	64	100	130.2	181	36.2	53.2

Note 1: Indicates data pertains to 1974

SOURCES: UN Bulletin of Statistics on World Trade in Engineering Products, New York
(Issues for 1975, 1976, 1978 and 1979)

Table C.12. Export Values Shares and Growth Rates for Developing Countries and Territories by Type of Capital Goods.

Code Number	SITC Group	1967 Value ($ 000)	1967 % of Group Total	1967 % of World	1970 Value ($ 000)	1970 % of Group Total	1970 % of World	1973 Value ($ 000)	1973 % of Group Total	1973 % of World	1975 Value ($ 000)	1975 % of Group Total	1975 % of World	1977 Value ($ 000)	1977 % of Group Total	1977 % of World	% Growth Rate 70-77 Value
729	Electrical Machines	72101	0.19	2.25	232178	0.21	4.09	760774	0.78	6.94	1051297	0.50	6.96	1952335	0.68	8.80	35.6
732	Road Motor Vehicles	67172	0.18	9.55	157797	0.14	0.72	452316	0.47	1.11	945455	0.45	1.63	1149530	0.40	1.41	33.1
719	Non Electrical Machines	50450	0.13	0.56	131564	0.12	0.92	362976	0.37	1.43	539223	0.26	1.31	724214	0.25	1.45	27.9
714	Office Machines	30011	0.08	1.31	77328	0.07	1.77	330297	0.34	4.38	432725	0.20	4.54	414368	0.14	2.88	27.1
861	Instruments Apparatus	16487	0.04	0.75	36435	0.03	1.07	183268	0.19	2.99	342492	0.16	3.90	408492	0.14	3.44	41.4
711	Power (Non Elec.) Machinery	25222	0.07	0.62	66747	0.06	1.15	154836	0.16	1.81	412357	0.20	3.12	492417	0.17	2.86	33.7
722	Elec. Power Mach.Switch	20769	0.05	0.88	56158	0.05	1.57	145100	0.15	2.10	313181	0.15	2.96	559988	0.20	3.49	39.1
718	Mach. for Special Ind.	58286	0.15	1.83	61481	0.06	1.22	128833	0.13	1.54	275759	0.13	1.82	330559	0.12	1.82	27.4
734	Aircraft	55557	0.15	2.16	42493	0.04	1.02	127911	0.13	1.90	155657	0.07	1.65	154126	0.05	1.53	0.9
735	Ships and Boats	35660	0.09	1.22	34609	0.03	0.81	110229	0.11	1.09	351821	0.17	2.15	886682	0.31	4.30	58.9
717	Textile, Leather Mach.	10750	0.03	0.52	26062	0.02	0.85	54607	0.06	0.98	96681	0.05	1.43	105674	0.04	1.57	22.1
695	Tools	11984	0.03	1.56	23191	0.02	1.97	50741	0.05	2.56	99361	0.05	3.35	146853	0.05	3.80	30.4
712	Agricultural Machinery	7768	0.02	0.35	13055	0.01	0.48	42376	0.04	0.85	108192	0.05	1.17	131522	0.05	1.37	39.1
723	Electric Dist. Machinery	6504	0.02	1.07	20095	0.02	2.03	39612	0.04	2.63	92464	0.04	3.40	107318	0.04	2.87	27.8
733	Road Vehicles Non Motor	4167	0.01	1.06	12938	0.01	2.14	37840	0.04	2.36	80530	0.04	3.85	119426	0.04	4.09	37.2
715	Metal Working Machinery	8528	0.02	0.42	14738	0.01	0.48	22974	0.02	0.44	54970	0.03	0.69	70025	0.02	0.80	25.3
731	Railway Vehic.	1831	0.00	0.25	6709	0.01	0.77	20997	0.02	1.15	66211	0.03	2.27	118726	0.04	3.83	50.8
726	Electrical Med. Xray	395	0.00	0.20	929	0.00	0.28	4820	0.00	0.73	5233	0.00	0.45				

Source: Handbook of International Trade and Development Statistics, 1977, 1979, 1980 - UNCTAD secretariat computations based on U.N. Statistical Office data.

Explanatory notes:

- Ranked by 1973 values
- Columns 1,4,7,11 and 14 show export values f.c.b. in thousands of dollars.
- Columns 2,5,8.12 and 15 show the percentage share of each commodity in the group total (Developing Countries).
- Columns 3,6,9.13 and 16 refer to the percentage share which the value indicated represents in the world total exports of that commodity.

Table C.11 also serves to identify some of the more dynamic types of capital goods within the main subsectors of capital goods. For example, even between 1975 and 1978 the export values (in current prices) of engines (SITC 711) virtually tripled and those of agricultural machinery (SITC 712) doubled in all countries except India and Singapore. Other categories with particularly impressive export performance were special industrial machinery (SITC 718), other special machinery (SITC 719), electric power machinery (SITC 722), telecommunications apparatus (SITC 724), other electric machinery (SITC 729), road motor vehicles (SITC 733) and ships and boats (SITC 735).[19/]

Maintaining our attention on the more detailed commodity classes of capital goods exports, but returning once again to the export performance of developing countries as a whole, Table C.12 provides even more concrete evidence concerning the rising shares of the South in world trade of capital goods and the extremely high rates of growth of capital goods exports (in current prices) between 1967 and 1977. As a result the South's share of world exports of other electrical machinery (SITC 729) grew from 2.25 per cent in 1967 to 8.80 per cent in 1977. Likewise, its shares of world exports of engines (SITC 711), electric power machinery (SITC 722), ships and boats (SITC 735), textile and leather machinery (SITC 717), agricultural machinery (SITC 712), road vehicles (non-motor) (SITC 733), and railway vehicles (SITC 731) all more than tripled over the same period.

Table C.13 relates the export growth performance of the South as a whole at the three-digit SITC level to those of both the North and the world and distinguishes also by destination of such exports. From the column labelled "world" it can be seen that the average annual growth rates of the South exceeded 10 per cent in real terms in all sectors of capital goods other than textile and leather machinery in which the growth rate was a healthy 7.50 per cent per annum despite the fact that world exports were declining. In most sectors Southern exports were growing two to three times as fast as Northern exports. Southern exports to the South were growing slower than those to the

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19/ Note that a couple of these three-digit categories are not officially treated as capital goods though the remaining terms within each such category are.

Table C.13. Average Annual Growth Rates of Capital Goods by Type and Region of Origin and Destination in Constant Prices of 1975 for the Period 1970-1977.

	North	South	World
SITC: 711 Power Generating Machinery			
North	5.65	9.51	6.76
South	19.09	10.36	15.61
World	5.97	9.54	7.01
SITC: 712 Agricultural Machinery and Implements			
North	9.19	4.19	7.95
South	21.23	15.65	16.72
World	9.22	4.56	8.04
SITC: 714 Office Machines			
North	4.21	3.77	4.16
South	10.98	10.81	10.96
World	4.43	4.47	4.43
SITC: 715 Metalworking Machinery			
North	1.93	10.28	3.69
South	24.03	14.11	17.05
World	2.03	10.42	3.86
SITC: 717 Textile and Leather Machinery			
North	-.84	2.57	-.24
South	20.80	4.46	7.50
World	0.67	2.69	-.43
SITC: 718 Machines for Special Industries			
North	4.61	9.96	6.43
South	15.73	17.12	16.86
World	4.67	10.31	6.64
SITC: 719 Machinery and Appliances and Parts (n.e.s.)			
North	5.11	11.62	7.06
South	31.95	17.98	24.78
World	5.54	11.83	43.28

Table C.13. continued

SITC: 722			
Electric Power Machinery and Switchgear			
North	4.91	13.97	8.02
South	22.61	29.68	25.07
World	5.58	14.58	8.66
SITC: 723			
Equipment for Distributing Electricity			
North	2.34	11.39	6.32
South	15.50	21.02	18.28
World	3.01	11.99	6.98
SITC: 724			
Telecommunications Apparatus			
North	5.73	10.78	7.43
South	16.79	21.03	17.58
World	7.05	11.40	8.45
SITC: 725			
Domestic Electrical Equipment			
North	5.82	11.07	6.75
South	32.55	18.62	23.35
World	6.29	12.06	7.40
SITC: 726			
Electrical Apparatus for Medical Purposes			
North	11.72	10.16	11.27
South	42.33	9.05	31.61
World	11.88	10.18	11.39
SITC: 729			
Other Electrical Machinery			
North	5.37	11.69	6.77
South	17.71	19.97	18.27
World	6.44	12.51	7.80
SITC: 731			
Railway vehicles			
North	7.98	7.91	7.96
South	15.72	13.25	14.39
World	8.14	8.09	8.14

Table C.13. continued

SITC: 732			
Road Motor Vehicles			
North	7.08	10.31	4.67
South	17.99	23.39	22.12
World	7.12	10.98	7.85
SITC: 733			
Road Vehicles other than Motor			
North	9.11	15.34	10.62
South	33.76	16.90	21.05
World	9.56	17.20	11.13
SITC: 734			
Aircraft			
North	-1.99	8.04	1.85
South	11.61	12.28	11.76
World	-1.73	8.07	2.00
SITC: 735			
Ships and Boats			
North	7.98	13.23	10.48
South	17.24	32.76	24.52
World	8.31	13.94	11.00

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

North in the power generating machinery, agricultural machinery, office machines, metal working machinery, textile and leather machinery, other machinery (SITC 719) domestic electrical equipment, railway vehicles, and road vehicles other than motor subsectors but more rapidly than those to the North in the machines for special industries (SITC 718), electric power and switchgear, equipment for distributing electricity, telecommunications apparatus, other electrical machinery, road motor vehicles, aircraft and ships and boats subsectors.

The inevitable consequence of the rapid growth of capital goods production in most regions of the South has been a considerable amount of structural change. Tables C.14 and C.15 return to a higher level of subsector aggregation but demonstrate rather clearly the rather remarkable extent to

which the shares of all subsectors of capital goods have been increasing in manufacturing value added and employment, respectively, in the South as a whole and in all regions of the South except South Asia and Tropical Africa (presumably because of the very slow rates of overall growth and the relatively low investment shares in these regions).

Table C.14 in particular reveals some interesting patterns with respect to the shares of the different capital goods sectors in overall manufacturing value added in the South as a whole and in the separate regions thereof.

In the South as a whole the share is rising in all branches of capital goods except ISIC 390 Other Machinery, which in any case may not be reliable because of the residual nature of this category and hence the vulnerability of its trend to arbitrary changes in definitions of the other sectors. Even among the regions whose capital goods sectors have been growing rapidly such as Latin America, North Africa-Middle East and East Asia, there have been some fairly substantial differences. For example, non-electric machinery has experienced the sharpest rise in Latin America and South Asia but has grown only very slightly from a low base in East Asia and even fallen in Tropical Africa. Electric machinery has accounted for much of East Asia's growth, has grown rapidly also in North Africa-Middle East and has obtained an increasing share of manufacturing value added in Tropical Africa but has increased little in Latin America. Likewise, the performance of the transport equipment sector has varied considerably from region to region, increasing sharply in Latin America and North Africa-Middle East, remaining nearly constant in East Asia and declining in Tropical Africa and South Asia. Moreover, because of varying trends in productivity, the direction in trend of the manufacturing employment share of individual capital goods sectors can be the reverse of that with respect to value added.

Finally, in Table C.16 where the trade data is related to the production data, another aspect of structural change is revealed. Specifically production of each three-digit ISIC category is related to the corresponding value of apparent consumption - defined as gross production plus imports less exports in each of the four main subsectors of capital goods and in the capital goods sector as a whole. While in the South as a whole the share of production in apparent production has been rising relatively consistently in

Table C.14. Shares of Value Added in Capital Goods and Subsectors Thereof in Value Added of Total Manufacturing by Region and Year. (Based on Data in Prices and Exchange Rates of 1975.)

	Non-Electric Machinery	Electric Machinery	Transport Equipment	Professional Scientific Equip.Photo. Optics.	Other Machinery	Total
	382	383	384	385	390	0
Latin America						
1963	2.76	3.47	4.89	0.40	1.03	12.56
1967	3.63	4.37	5.62	0.50	1.13	15.26
1970	3.69	4.79	6.60	0.49	1.13	16.70
1975	6.06	5.12	8.40	0.59	1.19	21.37
1977	5.96	5.47	7.77	0.58	1.10	20.88
1979	6.15	5.87	8.33	0.54	1.09	21.98
Tropical Africa						
1963	0.82	1.50	3.33	0.03	1.26	6.93
1967	0.91	1.55	2.75	0.02	1.36	6.59
1970	0.92	1.67	2.92	0.03	1.49	7.03
1975	1.04	1.80	3.44	0.04	1.95	8.27
1977	0.77	1.77	6.01	0.02	0.96	9.53
1979	0.77	2.02	2.36	0.02	0.92	6.09
North Africa - Middle East						
1963	0.84	0.82	0.89	0.02	0.18	2.74
1967	0.71	1.22	1.18	0.05	0.36	3.51
1970	0.78	1.52	1.69	0.03	0.34	4.36
1975	1.55	3.13	2.89	0.03	0.46	8.06
1977	1.74	3.14	3.00	0.02	0.46	8.36
1979	1.98	3.63	2.66	0.0	0.43	8.70
South Asia						
1963	2.90	2.58	6.63	0.28	6.13	18.52
1967	4.18	3.31	4.94	0.28	6.63	19.33
1970	4.96	4.59	4.26	0.34	4.03	18.19
1975	5.82	4.97	4.47	0.48	4.28	20.03
1977	6.26	5.30	4.51	0.53	4.77	21.36
1979	6.92	5.74	4.50	0.72	-	(17.88)
East Asia						
1963	1.40	2.78	4.37	0.42	2.45	11.42
1967	1.64	3.38	3.79	0.52	2.46	11.78
1970	1.55	4.27	3.76	0.51	1.83	11.91
1975	2.18	5.90	5.10	0.81	1.64	15.63
1977	2.17	8.04	4.60	1.06	1.69	17.56
1979	2.57	9.61	4.99	1.05	1.24	19.47

Table C.14. Continued.

Total South						
1963	2.31	2.84	4.52	0.32	1.83	11.81
1967	3.01	3.59	4.65	0.39	1.96	13.60
1970	3.11	4.14	5.20	0.39	1.50	14.34
1975	4.69	4.78	6.61	0.51	1.52	18.11
1977	4.60	5.36	6.25	0.55	1.47	18.22
1979	4.86	6.08	6.46	0.56	0.94	18.90
Total World						
1963	9.43	6.22	9.00	2.16	1.72	28.51
1967	9.86	6.84	9.15	2.41	1.75	30.00
1970	10.17	7.50	8.93	2.54	1.68	30.81
1975	10.37	8.03	9.38	2.96	1.80	32.55
1977	10.21	8.48	9.62	3.14	1.86	33.31
1979	10.50	8.90	9.57	3.30	1.82	34.09
Southern Capital Goods Value Added in Total World Manufacturing Value Added.						
1963	0.19	0.24	0.38	0.03	0.16	1.00
1967	0.25	0.30	0.39	0.03	0.17	1.15
1970	0.27	0.35	0.44	0.03	0.13	1.23
1975	0.45	0.46	0.64	0.05	0.15	1.75
1977	0.44	0.52	0.60	0.05	0.14	1.76
1979	0.47	0.59	0.63	0.05	0.13	1.85

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

all sectors of capital goods, there are some significant differences from one region to another. In East Asia the share has been increasing rapidly in all sectors. In South Asia the production - apparent consumption ratios have also been rising in all sectors of capital goods, though generally at a slower rate than in East Asia. In the other regions growth in these shares has been limited only to certain sectors of capital goods, growth at the aggregate level being virtually imperceptible. In all regions of the South, except North Africa Middle East, the production-apparent consumption ratio in non-electric machinery remains well below those of the other sectors of capital goods.

Table C.15. Share of Employment in Capital Goods in Total Manufacturing Employment by Region and Year.

	Non Electric Machinery	Electric Machinery	Transport Equipment	Professional Scientific Equip. Photo. Optics.	Other Machinery	Total Capital Goods
	382	383	354	385	390	
Latin America						
1963	2.57	3.45	7.35	2.19	0.33	15.89
1967	3.12	4.25	6.62	1.83	0.42	16.23
1970	4.58	3.79	6.21	1.53	0.46	16.53
1975	7.07	4.31	6.65	2.75	0.39	21.17
1977	7.30	4.76	6.06	2.77	0.42	21.32
1979	7.39	5.10	5.82	2.91	0.38	21.61
Africa (South Sahara)						
1963	0.22	1.06	7.37	0.42	0.81	9.88
1967	0.24	1.40	4.89	0.34	0.97	7.82
1970	0.19	1.54	4.06	0.30	0.83	6.93
1975	0.15	1.77	3.66	0.29	0.83	6.70
1977	0.14	1.73	3.56	0.36	0.89	6.68
1979	0.13	1.77	3.56	0.24	0.67	6.37
North Africa - Middle East						
1963	2.15	2.31	4.51	0.03	0.42	9.41
1967	1.68	1.99	3.46	0.03	0.75	7.91
1970	1.81	2.09	4.02	0.04	0.67	8.62
1975	2.17	2.17	3.63	0.02	0.61	8.60
1977	1.77	3.77	3.12	0.02	0.49	9.16
1979	2.00	2.19	3.35	0.02	1.21	8.77
South Asia						
1963	4.91	3.09	8.65	1.33	0.0	17.98
1967	6.04	3.67	9.33	0.59	1.04	20.67
1970	5.80	4.14	9.20	0.60	1.20	20.94
1975	5.73	4.34	5.95	0.55	0.50	17.07
1977	5.84	4.21	5.41	0.60	0.50	16.57
1979	2.36	4.98	2.64	0.18	0.71	10.87
South-East Asia						
1963	1.97	2.22	3.59	1.31	2.95	12.04
1967	2.46	3.40	3.65	0.67	2.55	12.72
1970	1.91	4.29	3.27	0.75	3.67	13.89
1975	2.75	7.27	3.82	1.10	2.55	17.49
1977	2.88	8.84	4.30	1.44	2.74	20.19
1979	3.59	10.35	4.65	1.68	2.57	22.85

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table C.16. Share of Production in Apparent Consumption by Type of Capital Goods and Year 1970, 1975 and 1977

	Non-Electric Machinery	Electric Machinery	Transport Equipment	Professional and Scientific Equipment	Total Capital Goods
Latin America					
1970	0.393	0.687	0.691	0.817	0.774
1975	0.509	0.724	0.720	0.881	0.812
1977	0.352	0.824	0.802	0.925	0.748
Tropical Africa					
1970	0.098	0.288	0.102	0.105	0.150
1975	0.102	0.260	0.080	0.129	0.130
1977	0.106	0.289	0.209	0.114	0.212
North Africa-Middle East					
1970	0.063	0.211	0.209	0.033	0.156
1975	0.051	0.212	0.122	0.019	0.115
1977	0.084	0.247	0.205	0.024	0.173
South Asia					
1970	0.606	0.840	0.728	0.691	0.729
1975	0.699	0.861	0.704	0.812	0.767
1977	0.798	0.919	0.854	0.858	0.872
East Asia					
1970	0.134	0.561	0.412	0.220	0.382
1975	0.202	0.750	0.459	0.522	0.495
1977	0.354	0.888	0.665	0.721	0.738
South Total					
1970	0.307	0.584	0.518	0.654	0.571
1975	0.333	0.589	0.424	0.736	0.526
1977	0.324	0.698	0.590	0.814	0.608

Note: Data calculated from data series in U.S. dollars of 1975.

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Summary

To ensure that the reader does not wind up lost in the statistical detail that has been presented in this section, the following propositions that have been supported by the logic and statistical evidence presented in the section are underscored.

(1) Static allocative efficiency criteria and especially factor proportions are of less relevance to the determination of efficient production and trade patterns of capital goods industries than they are to other industries.

(2) Even so, the factor requirements of capital goods industries are not beyond the capabilities of developing countries as a whole. However, because several categories of capital goods have relatively high requirements of skills which are available and relatively cheap only in certain regions of the South and others have relatively high requirements of capital which is again available and cheap only in certain other regions of the South, substantially more capital goods production in the South would be feasible and economic under a feasible and effective programme of South-South co-operation than there would be otherwise.

(3) The importance of dynamic aspects of efficiency and in particular of learning-by-doing in capital goods industries justifies that high priority be given to capital goods production in the South.

(4) Another advantage of Southern capital goods production is the provision of technology that is more appropriate and efficient in both factor proportions and scale to the conditions prevailing in the various countries and regions of the South.

(5) There is quite considerable evidence that developing countries are able to efficiently produce capital goods with considerably greater labour-intensity and via smaller scale than they are generally assumed to be able to and than are Northern capital goods producers. Often this capability on the part of the South can be accomplished relatively quickly and inexpensively by importing the machinery for producing, and then producing, older vintages of Northern capital goods.

(6) It should be possible to overcome most of the obstacles to Southern production of capital goods through South-South co-operation through judicious allocative decisions across regions and subsectors of capital goods, and in particular by relying on multinational companies (joint ventures) of developing countries as the institutional vehicle. The one obstacle that is likely to remain insurmountable for the foreseeable future is the requirement of rapidity of new product development which characterizes some subsectors of capital goods. This would seem to rule out, or at least suggest that relatively low priority should be given to, the professional, scientific machinery and miscellaneous capital goods subsectors of capital goods as far as Southern production and South-South co-operation are concerned.

(7) On the one hand, the total value of the South's imports from the North may seriously overestimate the potential for Southern production via South-South trade. On the other hand, however, the estimates of such potential by Alexander Yeats, wherein only labour-intensive capital goods are considered, and exports to the North are taken as a precondition for such potential, may seriously underestimate that potential.

(8) Given the importance of dynamic considerations determining both the efficiency of capital goods production and the ability to export in judging the potential for growth of production and export of capital goods in the South, it is important to focus on those subsectors in which the South has in recent years achieved relatively high rates of growth of both production and exports. Very considerable evidence that this has been the case in virtually all subsectors of capital goods has been presented. Certainly this has been true of the three general subsectors favoured by previous considerations, namely non-electric machinery, electric machinery and transport equipment. Within these subsectors, particularly attractive branches of activity for development by the South would seem to be power-generating machinery (SITC 711), agricultural machinery (SITC 712), office machinery (SITC 714), metal-working machinery (SITC 715), textiles and leather machinery (SITC 717), other specialized non-electric machinery (SITC 718 and 719), electric-power generating machinery (SITC 727), miscellaneous electric machinery (SITC 729), railway vehicles (SITC 731), road motor vehicles (SITC 732) and ships and boats (SITC 735).

(9) It is extremely difficult to translate the above considerations into a precise estimate of the additional amount of production and trade of capital goods that might be obtained through the envisioned programme of South-South co-operation in capital goods in which a Southern Capital Goods Company would be created and treated as a partly or wholly domestic enterprise in all or most regions of the South. Nevertheless, since capital goods industries are deemed to constitute the logical focus for South-South co-operation, it is important to attempt to do so. Should an effective programme of South-South co-operation be brought into existence, it would seem reasonable that the rather high growth rates of value added and exports to the South could be maintained until 1990. Without such cooperation, however, further import substitution and export expansion in capital goods would be problematic, making it likely that the growth rates of production and exports between 1975 and 1990 would be considerably lower than in the recent past.

D. Industrial Development of the South via South-South Cooperation in Industries other than Capital Goods.

According to the indicators given in Table B.1. and analyzed more completely in the accompanying text in Section B, the single most promising area for development in the South via South-South cooperation is capital goods. But the various resource-based industries, such as metal products and possibly also rubber products in the light industry class and paper, industrial chemicals, other chemicals, glass, non-metalic minerals and non-ferrous metal industries of the basic products class and the petroleum and coal products, were also identified as industries with special potential for development via South-South cooperation.

A fairly high level of development of Southern production and export of the petroleum refining and petroleum and coal product sectors has already been achieved. Because these subsectors are characterized by economies of scale, capital-intensity, energy-intensity and human capital-intensity, a fair amount of South-South cooperation will certainly be required if these sectors are to be developed fully. Nevertheless, since much of the South's production of these industries has been or is being developed for export to the North, a very considerable degree of North-South co-operation is also required. Despite the fact that there is considerable excess capacity in almost all regions, because of the relatively little employment provided by such industries, redeployment of such industries from the North to the South seems to be proceeding considerably more smoothly than in other industries. Indeed, most accounts already concede to the South considerable success in this respect.[18/] For this reason, these industries are excluded from much of the remaining analysis of industries with special potential for development in the South on the basis of South-South cooperation. We also, for the most part, exclude the rubber industry from the Light Industry class because the case for it is only marginal in terms of the use of different scarce factors of production which may be available not in any single region of the South but

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18/ See, for example, "Downstream without a Paddle", The Economist 3-9 July, 1982, pp.70-71.

Table D.1. Gross Production, Imports, Exports, Apparent Consumption and the Share of Production in Apparent Consumption for the Years 1970, 1975 and 1977.

		341 Paper Products	351 Industrial Chemicals	352 Other Chemicals	362 Glass	369 Non-metallic Minerals	372 Non-ferrous Metals	381 Metal Products
North								
Gross Production	1970	109.6	164.0	85.0	20.9	90.0	76.4	185.8
	1975	114.3	215.2	102.6	24.9	105.6	86.7	216.5
	1977	130.6	259.4	121.1	30.1	115.1	101.2	241.4
Imports	1970	12.2	21.8	5.9	2.4	3.0	13.8	10.8
	1975	16.3	29.2	7.4	2.6	3.9	18.5	14.8
	1977	16.9	36.5	8.7	3.2	4.5	19.4	19.1
Exports	1970	14.2	27.4	8.1	2.8	3.6	10.8	13.8
	1975	19.1	39.4	9.8	3.1	5.4	16.1	20.1
	1977	19.8	45.7	11.7	3.8	6.9	17.0	27.2
Apparent Consumption	1970	107.7	108.4	77.4	20.6	89.4	79.4	182.8
	1975	111.5	205.0	100.3	24.4	104.0	89.1	211.2
	1977	127.8	250.2	118.1	29.5	112.6	104.6	233.3
Share of Production in Apparent Consumption	1970	1.018	1.036	1.096	1.020	1.007	0.962	1.016
	1975	1.025	1.049	1.024	1.022	1.015	0.973	1.025
	1977	1.022	1.037	1.025	1.022	1.022	0.968	1.035
South								
Gross Production	1970	8.5	10.9	15.0	1.9	7.8	7.0	14.7
	1975	10.9	18.5	23.3	3.1	11.7	9.1	20.6
	1977	11.8	20.2	25.9	3.3	13.5	8.7	19.9
Imports	1970	2.2	7.5	2.9	0.6	0.9	1.6	3.8
	1975	3.4	12.6	3.4	0.8	2.2	3.0	6.7
	1977	3.5	12.6	4.0	1.0	3.5	3.5	10.9
Exports	1970	0.3	1.9	0.7	0.2	0.3	4.6	0.8
	1975	0.6	2.7	1.0	0.2	0.6	5.5	1.4
	1977	0.7	3.3	1.1	0.4	1.0	6.0	2.8
Apparent Consumption	1970	10.5	16.5	17.3	2.3	8.4	4.0	17.8
	1975	11.6	27.9	25.3	3.5	13.3	5.7	23.0
	1977	14.6	29.4	28.8	4.0	16.0	6.2	27.9
Share of Production in Apparent Consumption	1970	0.814	0.654	0.871	0.823	0.928	1.7	0.8
	1975	0.757	0.637	0.907	0.848	0.883	1.4	0.8
	1977	0.805	0.687	0.898	0.835	0.846	1.4	0.7

Source: UNIDO data based; information suplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.2. Share of Production in Apparent Consumption for the Years 1970, 1975 and 1977, by Region of the South.

	341 Paper	351 Industrial Chemicals	352 Other Chemicals	362 Glass	369 Non-metallic Minerals	372 Non-ferrous Minerals	381 Metal Products
Latin America							
1970	0.861	0.792	0.925	0.859	0.970	1.534	0.870
1975	0.853	0.771	0.953	0.917	0.968	1.360	0.899
1977	0.873	0.796	0.955	0.914	0.971	1.583	0.920
Tropical Africa							
1970	0.601	0.514	0.628	0.460	0.772	-	0.574
1975	0.553	0.503	0.691	0.464	0.670	-	0.617
1987	0.487	0.456	0.704	0.297	0.520	-	0.506
North Africa-Middle East							
1970	0.654	0.433	0.755	0.728	0.899	0.910	0.565
1975	0.532	0.522	0.788	0.851	0.736	0.838	0.445
1977	0.542	0.507	0.737	0.709	0.622	0.717	0.262
South Asia							
1970	0.868	0.753	0.971	0.911	0.996	0.782	1.000
1975	0.845	0.684	0.990	0.931	0.999	1.095	0.994
1977	0.875	0.845	0.982	1.030	1.008	0.948	1.021
East Asia							
1970	0.557	0.522	0.771	0.813	0.875	-	0.737
1975	0.694	0.448	0.858	0.841	0.885	-	0.774
1977	0.667	0.529	0.855	0.746	0.954	-	0.962

Source: From Table D.1.

only in the South as a whole. 19/

19/ Natural rubber or petroleum-based materials and capital are the only scarce factors of production relevant to this industry and in the case of capital (as shown in Table B.1 above) the requirements are only slightly above-average in two of the relevant indicators, namely, ICORs for developed countries and value added labour ratios for the U.S., and below-average in each of the other indicators. Since both capital and petroleum-based materials, are available in the North Africa-Middle East region, interregional co-operation among developing countries would seem rather unnecessary for successful development of the industry at least for that region of the South.

The potential for development of the previously identified resource-based industries in the South on the basis of global (as apposed to national or even regional) import substitution is demonstrated in the lower half of Table D.1. in the form of relatively low shares of domestic production in apparent consumption of the South. Note that even as recently as 1979 with the exception of ISIC 372 (non-ferrous metals) [20/] these shares are all less than .9 and are as low as .687 for ISIC 351 (industrial chemicals) and .700 for ISIC 381 (metal products). Not surprisingly, except for ISIC 372 these relatively low shares contrast rather sharply with those of the North in the same industries (which as shown in the top half of the table are greater than 1.0 as recently as 1977. In some sectors, such as industrial chemicals and other chemicals, the South has succeeded in raising the production - apparent consumption ratios between 1970 and 1977, but in all the others these ratios have actually declined.

Table D.2 presents the same production-apparent consumption ratios for each region of the South. Some fairly substantial differences between regions can easily be discerned. For example, the ratios are exceptionally high for South Asia, indeed exceeding unity in three of the seven sectors. On the other hand, the ratios are generally very low and falling for Tropical Africa and North Africa-Middle East. With the exception of glass in East Asia the ratios are generally rising in Latin America, South Asia and East Asia.

From Table D.3 it can be seen that all seven of the selected sectors have been growing relatively rapidly at the world level, more than doubling in real terms between 1963 and 1979. The table also reveals the rather extreme degree to which Latin American value added in these seven sectors dominates in overall production of the South. Both the absolute figures presented in Table D.3 and the growth rates for the period 1963-1979 derived from these figures and given in Table D.4 make clear the rather remarkable extent to which the growth rates in the Southern regions in these sectors have exceeded those of the world as a whole. Comparatively speaking, the growth rates of value added in these sectors in the Tropical Africa and South Asia regions

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20/ The share of production in apparent consumption in this sector is unrealistically high because of the inclusion of slightly processed metals exports in this sector.

Table D.3. Value Added at Constant Prices of 1975 by Sector and Selected Years between 1963 and 1979.

UNITAD Region	341 Paper	351 Industrial Chemicals	352 Other Chemicals	362 Glass	369 Non-metallic Minerals	372 Non-ferrous Metals	381 Metal Products
Latin America							
1963	1003	1179	2163	333	1202	785	1832
1967	1397	1671	3093	434	1559	1082	2588
1970	1777	2395	4054	569	2113	1395	3325
1975	2105	3624	6410	875	3039	1757	4604
1977	2373	4092	7532	978	3389	2096	5095
1979	2848	4522	8865	1088	3831	2325	6015
Tropical Africa							
1963	58	85	138	18	99	93	135
1967	85	116	155	28	151	74	222
1970	115	127	214	31	189	108	280
1975	157	195	358	41	254	147	443
1977	177	180	472	46	250	153	551
1979	205	212	433	58	242	163	437
North Africa - Middle East							
1963	150	116	173	44	272	144	213
1967	169	185	260	50	407	196	279
1970	220	275	403	88	520	234	411
1975	290	649	646	286	945	416	723
1977	342	673	871	318	1122	291	800
1979	358	833	892	412	1451	432	638
South Asia							
1963	173	251	645	53	253	96	295
1967	222	359	757	65	303	134	409
1970	285	510	883	65	402	189	561
1975	342	736	962	70	486	168	612
1977	349	994	1159	81	573	220	660
1979	398	1134	1291	103	623	241	704
East Asia							
1963	125	125	272	62	212	33	240
1967	146	182	384	114	341	74	357
1970	159	340	533	124	446	78	400
1975	332	677	962	146	648	123	659
1977	470	895	1182	190	994	200	964
1979	590	1135	1588	247	1340	331	1191
World							
1963	27556	29729	25760	7570	31845	15674	57221
1967	34885	45489	34943	9820	38029	21050	73722
1970	42094	62778	45008	12282	46782	26336	91751
1975	44502	83664	56402	14963	56009	30245	108046
1977	50862	100629	66770	18009	61564	35290	124558
1979	56434	112883	75924	19982	67595	38208	137866

Table D.3. Continued.

Developing Countries Share (%) in World Total.							
1963	5.47	5.91	13.16	6.74	6.42	7.34	4.8
1967	5.79	5.53	13.30	7.04	7.24	7.41	5.2
1970	6.07	5.32	13.52	7.14	7.89	7.60	5.4
1975	7.25	7.05	15.56	9.49	9.61	8.64	6.5
1977	7.30	6.81	16.80	8.96	10.31	8.39	6.5
1979	7.79	6.96	17.21	9.55	11.08	9.14	6.6

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

have been well below those of the other regions of the South and in several sectors at rates below those of the world as a whole. As can be easily seen, Table D.4 includes those additional sectors ISIC 353 (petroleum refining), ISIC 354 (petroleum and coal products), and ISIC 355 (rubber) in addition to the other seven sectors included in the preceding tables. While the growth rates attained by East Asia in all these sectors are extremely high, its 1963 levels were so small that even in 1979 only in non-metallic minerals did its value added exceed 25 per cent of that of Latin America.

Table D.5 presents comparable data on employment per thousand dollars of value added at constant prices of 1975 for each of the ten aforementioned sectors in each of the five regions of the South for the years 1963, 1970 and 1979. In almost all cases employment per unit of value added is seen to have been falling rapidly, thereby indicating that its inverse, labour productivity, has been rising rapidly. The exceptions are other chemicals and non-ferrous metals in Latin America, paper, other chemicals, glass and to a lesser extent industrial chemicals in North Africa-Middle East, and paper and other chemicals in South Asia. 21/ The figures also reveal considerably greater employment per unit of value added in South Asia than in the other regions and also in glass, non-metallic minerals

21/ These exceptions are most likely explained in terms of changing sectoral mixes, increased weights being attached to labour-intensive subsectors, rather than in terms of declining labour productivity.

Table D.4. Growth Rates of Manufacturing Value Added by Sector at Constant Prices 1963-1979

	353 Petroleum Refining	354 Petroleum and Coal Products	355 Rubber	341 Paper	351 Industrial Chemicals	352 Other Chemicals	362 Glass	369 Non-metallic Minerals	312 Non-ferrous Metals	381 Metal Products
World	4.94	3.95	5.43	3.20	8.18	6.79	6.59	4.68	4.99	5.23
Latin America	3.74	7.12	7.11	4.94	9.34	10.88	9.45	8.19	7.02	7.37
Tropical Africa	5.81	2.43	6.81	7.45	5.99	14.04	6.80	4.77	5.98	11.14
North Africa -Middle East	4.96	26.39	11.78	7.63	16.09	13.71	23.88	13.68	3.70	11.74
South Asia	0.78	8.71	5.35	3.43	11.76	4.64	3.74	6.09	2.56	2.75
East Asia	8.00	14.17	10.91	18.80	17.51	14.20	7.37	14.29	16.99	15.80

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.5. Employment per Unit of Value Added by Sector 1963, 1970 and 1979 by Region

	353 Petroleum Refining	354 Petroleum and Coal Products	355 Rubber	341 Paper	351 Industrial Chemicals	352 Other Chemicals	362 Glass	369 Non-metallic Minerals	372 Non-ferrous Metals	381 Metal Products
Latin America										
1963	12	104	79	96	230	13	186	64	31	46
1970	9	46	59	81	86	36	148	52	33	44
1979	16	48	53	76	62	27	103	55	31	39
Tropical Africa										
1963	87	-	287	102	1157	84	107	264	99	194
1970	23	-	172	144	337	108	119	208	39	211
1979	40	-	119	136	218	118	160	244	33	168
North Africa - Middle East										
1963	83	-	150	171	628	141	456	304	417	349
1970	96	-	118	186	299	239	477	324	105	308
1979	112	-	158	256	309	141	663	333	414	342
South Asia										
1963	159	-	482	432	742	268	779	682	392	544
1970	73	322	452	313	632	291	867	552	264	334
1979	59	416	405	456	124	291	744	482	285	339
East Asia										
1963	17	-	403	236	566	385	208	566	182	417
1970	8	279	396	282	163	142	221	185	138	353
1979	6	94	207	152	50	59	190	151	67	236

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

and industrial chemicals than in other sectors. Not surprisingly, Latin America, with its relatively high per capita income and wage rates, has the lowest employment-value added ratios among regions, and petroleum refining, an extremely capital-intensive sector, has the lowest such ratios among sectors. Despite the relatively high per capital income in much of North Africa-Middle East, the region is relatively high in employment per unit of value added.

Table D.6 reveals that in the world as a whole only four of the ten sectors included i.e., ISIC 351 (industrial chemicals), ISIC 352 (other chemicals), ISIC 362 (glass) and ISIC 381 (metal products), have displayed the desirable property of rising shares in total manufacturing value added. For the most part, however, more of these sectors have rising shares in manufacturing value added in the various regions of the South. For example, in South Asia all ten sectors have experienced rising shares; in Latin America all except ISIC 353 (petroleum refining) have had rising shares, and in Tropical Africa all except ISIC 372 (non-ferrous metals) have had increasing shares.

We turn now to trade. In Table D.7 are the 3 x 3 trade matrices for each of the seven ISIC categories - ISIC 341, 351, 352, 362, 369, 372 and 381 - for the years 1970, 1975 and 1977 in millions of constant U.S. dollars of 1975. While in 1970 Southern exports accounted for more than 10 per cent of world exports only in ISIC 372 a category which often involves only a minor amount of local processing, by 1977 the Southern share in this sector had reached almost 30 per cent and its share in world exports of ISIC 369 (non-metallic minerals) had exceeded 40 per cent. Although these sectors are not among the most important in terms of absolute values, the tendency for the Southern shares in imports of both the North and the South to grow - even if from rather small shares in the base period - may be taken as evidence of considerable potential for further growth. Notice also that Southern exports to the South accounted for more than half of the South's exports for all commodities included in the table except industrial chemicals ISIC 351 and non-ferrous metals ISIC 372.

Further evidence of Southern growth potential in these seven industries is provided in Table D.8. In six of the seven sectors Southern exports at constant prices grew more rapidly than Northern exports between 1970 and 1977

Table D.6. Share of Manufacturing Value Added by Region and Sector 1963, 1970 and 1979

	353 Petroleum Refining	354 Petroleum and Coal Products	355 Rubber	341 Paper	351 Industrial Chemicals	352 Other Chemicals	362 Glass	369 Non-metallic Minerals	372 Non-ferrous Metals	381 Metal Products
World										
1965	2.3	0.6	1.4	3.2	3.4	3.0	6.9	3.7	1.8	6.6
1970	2.5	0.5	1.4	3.1	4.7	3.4	0.9	8.5	2.0	6.8
1979	2.3	0.4	1.3	2.8	5.7	3.8	1.0	3.4	1.9	6.9
Latin America										
1963	8.8	0.3	1.6	2.4	2.8	5.1	0.8	2.8	1.8	4.3
1970	7.8	0.5	1.8	2.6	3.5	6.0	0.8	3.1	2.1	4.9
1979	5.9	0.5	1.9	2.6	4.1	8.0	1.0	3.4	2.1	5.4
Tropical Africa										
1963	0.8	0.1	1.3	1.6	2.3	3.8	0.5	2.7	2.5	3.7
1970	2.6	1.1	1.6	1.8	2.0	3.4	0.5	3.0	1.7	4.5
1979	2.7	1.1	2.0	2.4	2.4	5.0	0.7	2.8	1.9	5.0
North Africa - Middle East										
1963	41.6	0.3	1.3	1.7	1.3	1.9	0.5	3.0	1.6	2.4
1970	38.7	0.3	1.0	1.6	2.0	3.0	0.6	3.8	1.7	3.0
1979	28.1	1.4	0.9	1.6	3.8	4.0	1.8	6.5	1.9	3.0
South Asia										
1963	1.1	0.2	1.1	1.6	2.3	5.9	0.5	2.3	0.9	2.7
1970	1.6	0.4	1.3	2.0	3.5	6.1	0.5	2.8	1.3	3.9
1979	1.5	0.7	1.6	2.2	6.4	7.3	0.8	3.5	1.4	4.4
East Asia										
1963	11.5	0.8	3.1	1.7	1.7	3.7	0.8	2.9	0.4	3.2
1970	10.3	0.9	2.8	1.3	2.7	4.3	1.0	3.6	0.6	3.2
1979	6.5	0.8	2.2	1.7	3.3	4.6	0.7	3.9	1.0	3.4

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

and in five of the seven sectors exports of the South to the South (imports of the South from the South) grew faster than those to the North. The average annual growth rate in South-South trade (at constant prices) exceeded 9 per cent in all sectors except ISIC 352 (other chemicals).

A more detailed analysis of the factors underlying the rapid growth of Southern exports in general and of those to Southern regions, in particular, can be obtained with the use of the trade share data for the same sectors and years which are given in Tables D.9a - D.9g. An entry in any of these tables appearing in section i, column j and row t (which may be designated as ijt for the year t indicated at the left hand margin of the row) represents the share of imports of region j originating in region i. While the last two columns and sections pertain to the North as a whole and the South as a whole, respectively, the preceding columns and sections represent the individual regions of the South. For each section/column entry there are three row entries, the observations on the relevant share for the years 1970, 1975 and 1977, respectively.

For example, with reference to Table D.9a for the trade shares for ISIC 341 (paper and paper products), the entries in the last two sections and columns (at the bottom right corner) of the table indicate that between 1970 and 1977 (1) the share of imports from the North in total Northern imports of paper and paper products decreased slightly from 99.4% to 98.7% while that from the South increased from a paltry 0.6% to 1.3%, and (2) the share of imports from the North in Southern imports decreased from 89.4% to 87.2% while that from the South increased from 10.6% to 12.8%. Likewise, from the entries in the Latin America row in the last two columns of the table it can be seen that between 1970 and 1977 the shares of Northern and Southern imports originating from Latin America increased from 0.2% to 0.8% in the former case and from 5.2% to 5.4% in the latter case, or about one-half of the overall South share in both cases. The shares of East Asia in both Northern and Southern imports of paper increased sharply between 1970 and 1977 so as in both cases to become the second most important Southern source (behind Latin America) of such imports by 1977. From the entries for the first five columns of the bottom row it can be seen that the Southern shares of regional imports in 1970 exceeded ten percent only in Latin America and East Asia. In both such cases, moreover, the bulk of the Southern share was intraregional,

Table D.7. Trade Matrices by Sector and Year 1970, 1975 and 1977.
(In Millions of U.S. Dollars of 1975.)

341 Paper Products.

	1970			1975			1977		
	South	North	World	South	North	World	South	North	World
South	238	73	311	413	205	618	454	232	685
North	2014	12173	14187	3022	16093	19115	3080	16675	19756
World	2251	12247	14498	3435	16298	19733	3534	16907	20441

351 Industrial Chemicals.

	South	North	World	South	North	World	South	North	World
South	594	1288	1882	1239	1493	2732	1269	2081	3349
North	6911	20494	27405	11615	27808	39423	11296	34440	45736
World	7505	21782	29287	12854	29301	42155	12564	36521	49086

352 Other Chemicals.

	South	North	World	South	North	World	South	North	World
South	375	335	710	496	499	996	579	514	1093
North	2567	5577	8145	2856	6929	9784	3459	8235	11694
World	2942	5912	8854	3353	7427	10779	4038	8749	12788

362 Glass.

	South	North	World	South	North	World	South	North	World
South	100	52	151	155	84	239	255	107	362
North	463	2368	2830	613	2475	3087	764	3072	3836
World	562	2419	2982	767	2559	3326	1019	3179	4198

369 Non-metallic Minerals.

	South	North	World	South	North	World	South	North	World
South	256	81	337	494	114	688	814	2651	3465
North	684	2934	3618	1664	3742	5406	195	4285	4480
World	940	3014	3955	2158	3856	6014	1009	6937	7946

372 Non-ferrous Metals.

	South	North	World	South	North	World	South	North	World
South	528	4121	4649	906	4565	5471	977	5042	6019
North	1113	9678	10762	2129	13952	16081	2545	14407	16952
World	1641	13799	15441	3035	18517	21553	3522	19449	22971

381 Metal Products.

	South	North	World	South	North	World	South	North	World
South	476	314	791	806	594	1400	1716	1118	2834
North	3327	10504	13831	5883	14198	20080	9195	18008	27203
World	3804	10818	14622	6689	14791	21480	10911	19125	30036

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.8. Growth Rates of Intra and Interregional Trade Flows at Constant Prices of 1975 between 1970 and 1977. (In Per cent Per Annum.)

Sector	Region	South	North	World	Sector	South	North	World
341	South	9.7	17.9	11.9	351	11.5	7.1	8.6
Paper	North	6.3	4.6	4.8	Industrial	7.3	7.7	7.6
	World	6.7	4.7	5.0	Chemicals	7.6	7.7	7.7
352	South	6.4	6.3	6.4	362	14.3	10.9	13.3
Other	North	4.4	5.7	5.3	Glass	7.4	3.8	4.4
Chemicals	World	4.6	5.8	5.4		8.9	4.0	5.0
369	South	18.0	64.6	39.5	372	9.2	2.9	3.8
Non-metallic	North	-16.4	5.6	3.1	Non-ferrous	12.5	5.8	5.9
Minerals	World	1.0	12.6	10.5	Metals	11.5	5.0	5.8
381	South	20.1	19.9	20.0				
Metal	North	15.6	8.0	10.1				
Products	World	16.2	8.5	10.8				

Source: From Table D.7.

i.e. from Latin America to Latin America in the first case and from East Asia to East Asia in the latter case. Notably the share of regional imports of paper originating in the South increased in each of the six regions of the South between 1970 and 1977. Particularly large increases in shares of imports originating in the South were registered for North Africa-Middle East, South Asia and East Asia. Only in East Asia was the intra-regional share in the overall increase in the Southern share over one-half.

Similarly, from Table D.9b it can be seen that, while the South's share in imports of industrial chemicals by the South grew sufficiently so as to reach more than 10 per cent by 1977, the share of the South in Northern imports fell sufficiently sharply so as to reach only 5.6% in 1977. In both cases the shares of imports originating in Latin America were the largest among Southern regions in all years, the shares of North-Africa-Middle East and East Asia having grown substantially so as to become the next most important sources of both Northern and Southern imports of industrial chemicals by 1977. On the other hand, the Southern share in regional imports grew sufficiently rapidly in South Asia so that by 1977 the Southern share was highest in South Asia, with North Africa-Middle East and East Asia supplying the largest shares of

this region's imports from the South. The share of the South in imports of industrial chemicals of both East Asia and Latin America also increased substantially so as to exceed 10 per cent by 1977.

From Table D.9c it can be seen that, while the share of the South in imports of other chemicals of the North grew only modestly so as to reach 6% in 1977, the Southern share of Southern imports of other chemicals grew more rapidly so as to attain 14.4% in the same year. In both cases Latin America, East Asia and North Africa-Middle East (in that order) were the most important Southern suppliers. East Asia followed by Latin America and South Asia (China) had for the same sector the largest shares of imports coming from the South. Whereas in the case of East Asia intraregional imports constituted only a little over one-third of imports of other chemicals from the South (countries not included in the tables such as Taiwan and China being other important sources of supply), in Latin America imports from within the region comprise more than 90 per cent of the region's imports from the South.

Table D.9d shows that the patterns in the glass industry are rather similar. While the share of the South in Northern imports has risen only slightly (from 2.1% to 3.3%) between 1970 and 1977, that of Southern imports has risen substantially from 17.8 per cent to 25.1 per cent. The latter rise is explained primarily by the high and rising shares of imports from the South in total imports of the South in Latin America (from 20.5% to 37.5%), in East Asia (from 22.9% to 32.2%), in North Africa-Middle East (from 13.9% to 19.3%) and in South Asia (from 8.9% to 17.1%). Once again well over 90% of Latin America's imports from the South are intraregional whereas those of North Africa-Middle East, South Asia and East Asia include substantial and generally growing shares from other regions (though not from Latin America or Tropical Africa). The principal difference in this sector from the others analyzed in this section is the rapidly growing importance of South Asia in both Northern imports and Southern imports.

Table D.9e presents the trade shares for ISIC 369 (non-metallic minerals). As previously noted, this is a sector in which even by 1970 the South had already attained fairly high shares of imports in both the North and the South. Notice that the share of regional imports of non-metallic minerals originating in the South increased substantially over the 1970-1977 period in Latin America and East Asia, fell rather abruptly in Tropical

Africa, and was irregular in the other regions of the South. While the intraregional shares in such imports are relatively large in both Latin America and Tropical Africa the extra regional and Southern shares have grown rapidly in the case of North Africa-Middle East, South Asia and East Asia.

By referring to Table D.9f, it can be seen that the share of Northern imports of non-ferrous metals originating in the South which had already reached 33.2 per cent in 1970 declined to 25.8 per cent in 1977. This was partially offset, however, by an increase in the South's share of Southern imports from 35.4 per cent in 1970 to 37.7 per cent in 1977. Tropical Africa's shares in both regions were originally quite high but since then have fallen sharply. Those of East Asia, and in the case of Southern imports also Latin America, however, have increased quite sharply. The shares of imports from the South in regional imports have increased to over 50 per cent in both Latin America and countries not included in the table (mainly Taiwan Province of China and China). In the former case over 90 per cent of those shares originate in the region itself whereas in the latter case the largest portion in 1977 came from Latin America followed by Tropical Africa and North Africa-Middle East.

Finally, from Table D.9g it can be seen that the South's shares in imports of both the North and the South of metal products have risen substantially between 1970 and 1977. In this sector most of the growth of the Southern shares in both Northern and Southern imports has originated in East Asia and to a lesser extent North Africa-Middle East. As a result of the fact that East Asia and other excluded countries having managed to obtain growing shares of the Latin American market, metal products is the one sector in which the intraregional component has not constituted the overwhelming portion of the Southern share of Latin America imports. It can also be seen that East Asia has managed to obtain significant and growing shares in all regions of the South (except China). South Asia, on the other hand, has lost considerable portions of its base period shares in imports of metal products in Tropical Africa and North-Africa-Middle East. The Southern shares in imports of metal products were increasing in all regions of the South except Tropical Africa (and China) between 1970 and 1977.

Table D.9a. Trade Shares for Sector 341 Paper and Products.

	LA	TA	NE	SA	EA	N	S
Latin America (LA)							
1970	0.128	0.0	0.0	0.0	0.001	0.002	0.052
1975	0.130	0.002	0.0	0.005	0.004	0.005	0.048
1977	0.135	0.017	0.003	0.004	0.015	0.008	0.054
Tropical Africa							
1970	0.0	0.039	0.003	0.0	0.002	0.001	0.006
1975	0.001	0.020	0.005	0.001	0.002	0.0	0.004
1977	0.0	0.023	0.004	0.004	0.003	0.0	0.005
North Africa - Middle East (NE)							
1970	0.0	0.003	0.018	0.0	0.0	0.002	0.003
1975	0.0	0.002	0.053	0.001	0.0	0.001	0.011
1977	0.0	0.001	0.030	0.001	0.0	0.001	0.006
South Asia (SA)							
1970	0.0	0.007	0.022	0.015	0.006	0.0	0.006
1975	0.0	0.005	0.004	0.011	0.002	0.0	0.002
1977	0.0	0.002	0.006	0.038	0.002	0.0	0.004
East Asia (EA)							
1970	0.0	0.003	0.0	0.001	0.022	0.001	0.013
1975	0.001	0.003	0.010	0.014	0.050	0.002	0.019
1977	0.001	0.005	0.018	0.035	0.071	0.004	0.025
North (N)							
1970	0.871	0.937	0.938	0.968	0.877	0.994	0.894
1975	0.855	0.955	0.925	0.953	0.824	0.992	0.885
1977	0.849	0.936	0.912	0.892	0.819	0.987	0.872
South (S)							
1970	0.129	0.063	0.062	0.032	0.123	0.006	0.106
1975	0.145	0.045	0.075	0.047	0.176	0.008	0.115
1977	0.151	0.064	0.088	0.108	0.181	0.013	0.128

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.9b. Trade Shares for Sector 351 Industries Chemicals.

	LA	TA	NE	SA	EA	N	S
Latin America (LA)							
1970	0.066	0.0	0.001	0.001	0.005	0.034	0.026
1975	0.083	0.013	0.003	0.004	0.005	0.026	0.032
1977	0.098	0.008	0.005	0.013	0.003	0.025	0.037
Tropical Africa (TA)							
1970	0.0	0.048	0.002	0.008	0.004	0.004	0.006
1975	0.001	0.035	0.002	0.005	0.006	0.003	0.006
1977	0.001	0.036	0.001	0.009	0.004	0.003	0.005
North Africa - Middle East (NE)							
1970	0.009	0.001	0.016	0.019	0.006	0.004	0.013
1975	0.010	0.014	0.058	0.061	0.030	0.010	0.029
1977	0.003	0.003	0.041	0.059	0.006	0.013	0.017
South Asia (SA)							
1970	0.0	0.003	0.060	0.003	0.003	0.003	0.008
1975	0.0	0.005	0.008	0.003	0.005	0.001	0.003
1977	0.0	0.004	0.013	0.009	0.004	0.001	0.004
East Asia (SA)							
1970	0.0	0.007	0.005	0.003	0.038	0.002	0.013
1975	0.002	0.008	0.001	0.005	0.033	0.003	0.014
1977	0.005	0.005	0.012	0.056	0.065	0.004	0.022
North (N)							
1970	0.920	0.933	0.904	0.959	0.905	0.937	0.921
1975	0.897	0.912	0.915	0.915	0.889	0.952	0.903
1977	0.884	0.925	0.909	0.836	0.880	0.944	0.899
South (S)							
1970	0.080	0.067	0.096	0.041	0.095	0.063	0.079
1975	0.103	0.088	0.085	0.085	0.111	0.048	0.097
1977	0.116	0.075	0.091	0.164	0.120	0.056	0.101

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.9c. Trade Shares for Sector 352 Other Chemicals.

	LA	TA	NE	SA	EA	N	S
Latin America (LA)							
1970	0.175	0.0	0.0	0.002	0.007	0.026	0.064
1975	0.174	0.002	0.001	0.001	0.010	0.019	0.055
1977	0.199	0.001	0.001	0.002	0.006	0.020	0.054
Tropical Africa (TA)							
1970	0.0	0.022	0.001	0.0	0.0	0.005	0.004
1975	0.0	0.019	0.0	0.0	0.0	0.004	0.003
1977	0.0	0.013	0.0	0.0	0.0	0.004	0.003
North Africa - Middle East (NE)							
1970	0.0	0.003	0.022	0.006	0.001	0.009	0.005
1975	0.0	0.002	0.056	0.010	0.0	0.016	0.018
1977	0.0	0.001	0.047	0.007	0.0	0.008	0.015
South Asia (SA)							
1970	0.001	0.009	0.015	0.021	0.015	0.004	0.009
1975	0.0	0.012	0.008	0.039	0.009	0.006	0.007
1977	0.0	0.008	0.009	0.021	0.007	0.006	0.007
East Asia (EA)							
1970	0.001	0.003	0.002	0.019	0.088	0.005	0.025
1975	0.0	0.013	0.006	0.046	0.096	0.013	0.030
1977	0.001	0.018	0.011	0.060	0.120	0.013	0.032
North (N)							
1970	0.813	0.958	0.951	0.945	0.754	0.944	0.872
1975	0.800	0.938	0.918	0.879	0.647	0.933	0.852
1977	0.775	0.942	0.914	0.894	0.666	0.946	0.856
South (S)							
1970	0.187	0.042	0.049	0.055	0.246	0.056	0.128
1975	0.200	0.062	0.082	0.121	0.353	0.067	0.148
1977	0.225	0.058	0.086	0.106	0.334	0.060	0.144

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.9d. Trade Shares for Sector 362 Glass.

	LA	TA	NE	SA	EA	N	S
Latin America (LA)							
1970	0.199	0.0	0.0	0.0	0.0	0.007	0.081
1975	0.306	0.010	0.002	0.0	0.001	0.008	0.098
1977	0.361	0.003	0.001	0.0	0.001	0.007	0.103
Tropical Africa (TA)							
1970	0.0	0.049	0.003	0.0	0.0	0.0	0.008
1975	0.0	0.017	0.002	0.0	0.0	0.0	0.004
1977	0.0	0.008	0.001	0.0	0.001	0.003	0.002
North Africa - Middle East (NE)							
1970	0.0	0.0	0.057	0.002	0.0	0.0	0.010
1975	0.0	0.001	0.079	0.005	0.0	0.0	0.025
1977	0.0	0.0	0.070	0.002	0.0	0.001	0.025
South Asia (SA)							
1970	0.0	0.002	0.013	0.016	0.010	0.0	0.005
1975	0.0	0.005	0.011	0.034	0.016	0.001	0.008
1977	0.0	0.005	0.061	0.075	0.031	0.007	0.030
East Asia (EA)							
1970	0.002	0.023	0.014	0.024	0.069	0.007	0.030
1975	0.001	0.025	0.016	0.023	0.065	0.015	0.027
1977	0.004	0.029	0.016	0.063	0.139	0.010	0.036
North (N)							
1970	0.795	0.901	0.861	0.912	0.771	0.979	0.822
1975	0.685	0.890	0.864	0.878	0.753	0.968	0.792
1977	0.625	0.875	0.807	0.829	0.678	0.967	0.749
South (S)							
1970	0.205	0.099	0.139	0.088	0.229	0.021	0.178
1975	0.315	0.010	0.136	0.122	0.247	0.031	0.208
1977	0.375	0.125	0.193	0.171	0.322	0.033	0.251

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.9e. Trade Shares for Sector 369 Non-metallic Minerals.

	LA	TA	NE	SA	EA	N	S
Latin America (LA)							
1970	0.192	0.0	0.0	0.0	0.001	0.014	0.046
1975	0.181	0.003	0.0	0.0	0.002	0.012	0.027
1977	0.236	0.001	0.0	0.0	0.005	0.016	0.026
Tropical Africa (TA)							
1970	0.0	0.099	0.005	0.0	0.001	0.0	0.021
1975	0.0	0.104	0.005	0.0	0.0	0.0	0.023
1977	0.0	0.060	0.003	0.0	0.0	0.0	0.015
North Africa - Middle East (NE)							
1970	0.0	0.063	0.172	0.0	0.0	0.006	0.052
1975	0.0	0.005	0.076	0.0	0.0	0.001	0.034
1977	0.0	0.010	0.077	0.001	0.0	0.001	0.045
South Asia (SA)							
1970	0.0	0.003	0.095	0.035	0.003	0.004	0.026
1975	0.0	0.001	0.036	0.031	0.006	0.002	0.018
1977	0.0	0.001	0.025	0.091	0.013	0.003	0.018
East Asia (EA)							
1970	0.0	0.003	0.0	0.030	0.104	0.001	0.056
1975	0.010	0.002	0.057	0.302	0.257	0.008	0.089
1977	0.005	0.002	0.081	0.162	0.152	0.017	0.068
North (N)							
1970	0.807	0.812	0.722	0.812	0.692	0.973	0.728
1975	0.791	0.872	0.809	0.499	0.620	0.972	0.673
1977	0.751	0.918	0.745	0.746	0.649	0.956	0.764
South (S)							
1970	0.193	0.188	0.278	0.188	0.308	0.027	0.272
1975	0.209	0.128	0.191	0.501	0.380	0.028	0.327
1977	0.249	0.082	0.255	0.254	0.351	0.044	0.236

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.9f. Trade Shares for Sector 372 Non-ferrous Metals.

	LA	TA	NE	SA	EA	N	S
Latin America (LA)							
1970	0.284	0.0	0.0	0.005	0.0	0.127	0.078
1975	0.303	0.0	0.002	0.001	0.009	0.089	0.108
1977	0.499	0.0	0.0	0.001	0.013	0.097	0.159
Tropical Africa (TA)							
1970	0.043	0.116	0.035	0.284	0.007	0.148	0.224
1975	0.054	0.150	0.018	0.054	0.007	0.078	0.127
1977	0.002	0.111	0.007	0.122	0.008	0.077	0.049
North Africa - Middle East (NE)							
1970	0.0.	0.003	0.023	0.0	0.0	0.006	0.003
1975	0.011	0.006	0.069	0.012	0.002	0.007	0.023
1977	0.003	0.008	0.042	0.009	0.004	0.007	0.017
South Asia (SA)							
1970	0.0	0.013	0.124	0.003	0.019	0.001	0.015
1975	0.0	0.0	0.009	0.002	0.005	0.012	0.003
1977	0.0	0.005	0.013	0.018	0.003	0.006	0.004
East Asia (EA)							
1970	0.017	0.004	0.029	0.031	0.057	0.037	0.023
1975	0.002	0.014	0.026	0.111	0.068	0.043	0.026
1977	0.001	0.018	0.042	0.137	0.097	0.055	0.040
North (N)							
1970	0.656	0.854	0.773	0.674	0.851	0.668	0.646
1975	0.627	0.821	0.869	0.866	0.862	0.752	0.702
1977	0.487	0.854	0.873	0.707	0.843	0.742	0.623
South (S)							
1970	0.344	0.146	0.227	0.326	0.149	0.332	0.354
1975	0.373	0.179	0.131	0.194	0.138	0.248	0.298
1977	0.513	0.146	0.127	0.293	0.157	0.258	0.377

Source: UNIDO data base; information supplied by the Statistical Office of the United Nations with estimates by the UNIDO Secretariat.

Table D.9g. Trade Shares for Sector 381 Metal Products.

	LA	TA	NE	SA	EA	N	S
Latin America (LA)							
1970	0.082	0.0	0.0	0.0	0.0	0.004	0.025
1975	0.116	0.001	0.001	0.0	0.004	0.005	0.026
1977	0.112	0.001	0.001	0.002	0.004	0.007	0.018
Tropical Africa (TA)							
1970	0.0	0.025	0.0	0.0	0.0	0.001	0.004
1975	0.0	0.014	0.001	0.0	0.0	0.001	0.002
1977	0.0	0.005	0.0	0.0	0.0	0.001	0.001
North Africa - Middle East (NE)							
1970	0.00	0.002	0.016	0.004	0.0	0.001	0.005
1975	0.0	0.001	0.042	0.010	0.0	0.001	0.018
1977	0.0	0.0	0.041	0.009	0.003	0.001	0.023
South Asia (SA)							
1970	0.001	0.024	0.075	0.029	0.012	0.005	0.025
1975	0.001	0.011	0.012	0.034	0.010	0.004	0.009
1977	0.001	0.010	0.017	0.032	0.014	0.005	0.012
East Asia (EA)							
1970	0.010	0.026	0.008	0.032	0.073	0.012	0.036
1975	0.008	0.027	0.012	0.079	0.103	0.017	0.033
1977	0.023	0.040	0.067	0.058	0.117	0.028	0.059
North (N)							
1970	0.895	0.892	0.872	0.900	0.842	0.972	0.874
1975	0.853	0.904	0.911	0.811	0.799	0.960	0.879
1977	0.838	0.892	0.832	0.843	0.767	0.941	0.842
South (S)							
1970	0.105	0.108	0.128	0.100	0.158	0.028	0.126
1975	0.147	0.096	0.089	0.189	0.201	0.040	0.121
1977	0.162	0.108	0.168	0.157	0.233	0.059	0.158

Source: UNIDO Data Base; information supplied by the Statistical Ofice of the United Nations with estimates by the UNDIO Secretariat.

Summary

This section characterizes in greater detail the recent trends in gross production, imports, exports, apparent consumption, shares of domestic production in apparent consumption, shares of different exporting regions in regional imports of different regions, various growth rates and structural changes in the world, North, South and five separate regions of the South for each of the non-capital goods sectors identified in Section B as being worthy of serious consideration for priority in South-South cooperation.

In all of the designated sectors, i.e., paper products, industrial chemicals, other chemicals, glass, non-metallic minerals, non-ferrous metals and metal products - with the exception of non-ferrous metals where the production - apparent consumption ratio is misleadingly high because of the inclusion in production statistics of the metals which are only processed slightly before export in relatively crude form - the domestic production - apparent consumption ratios are relatively low, indicating the potential for further development of these sectors via global import substitution. In only two of these sectors, i.e., industrial and other chemicals, did the South make progress in this direction during the 1970's. Moreover, in the former case most of the progress was concentrated in South Asia and North Africa - Middle East and in the latter case in Tropical Africa and East Asia.

The production - apparent consumption ratios have already reached levels approaching unity in Latin America and South Asia in all sectors other than paper and industrial chemicals.

As in many other sectors of manufacturing Latin America currently enjoys the overwhelming share of Southern value added in each of these sectors. While starting from extremely low values in 1970, North Africa - Middle East and East Asia have generally experienced the highest growth rates in these sectors.

With respect to export growth rates between 1970 and 1977, the South has been most successful in non-metallic minerals, metal products, glass and paper in that order. Indeed, in the first two sectors Southern exports grew by twenty per cent or more per annum. Once again Latin America tended to

dominate over the other regions of the South in terms of shares of imports of both the North and the South in most of these sectors. Exceptions are non-metallic minerals (where both East Asia and North Africa-Middle East have become important suppliers) and metal products (where East Asia is now dominant). In the case of non-ferrous metals Tropical Africa had been the largest Southern supplier to both Northern and Southern imports as recently as 1970 but by 1977 had fallen behind Latin America and only slightly ahead of East Asia.

E. Conclusions and Suggestions for Future Research.

Southern Growth both historically and in virtually all modelling exercises and development analyses has been linked to growth of the North. In other words, both historically and in the economic development literature the South's engine of growth has been identified as being the North. When the North grows at a satisfactory rate, so too does the South or at least do those countries in the South that allow themselves to be linked to the North. Given the dominance of the Northern markets, Northern technology, and Northern capital and resources, the potential benefits of the traditional engine of growth are likely to remain.

While there is as yet no clear reason to believe that the usefulness of the North as an engine of growth for the South has come to an end, continued exclusive dependence on the traditional model and the related process of redeployment of certain industries from the North to the South seems increasingly problematic, especially as far as industrial development is concerned.

The redeployment of industries from the North to the South results from the combination of Northern growth, Northern - induced growth in the South and North-South cooperation. While such redeployment has never been a smooth and costless process, it has become particularly problematic recently now that redeployment has begun to reach the employment - sensitive industries and expecially after growth in the North has decelerated as it has during the last decade. The possibilities for natural redeployment from North to South on the basis of North-South interrelationships have been further strained by the current deadlock in North-South debate on the New International Economic Order. The statistical tables presented in Sections A, C and D above have indicated that during this last decade, Southern markets and Southern capital have perhaps for the first time begun to assert themselves so as to serve as the South's engine of growth. Whether this will be a passing phase on the way back to normality and recovery from the oil price shocks of the 1970s or a permanent turning point remains to be seen. Since the overwhelming proportion of the literature of world development has developed in order to explain the traditional model and also both its advantages and shortcomings, the purpose of the present report has been to explore albeit as simply as possible the logic for South-South cooperation as the basis for Southern and

indeed world growth and development.

While the report has neither developed new analytical tools nor presented definitive and quantitative demonstration of the benefits of South-South cooperation, it has presented considerable support of a qualitative nature for its main propositions.

There seems little reason to expect that the criteria for identifying sectors for specialization, development and export growth by the South to the North that have featured so prominently in the traditional literature of trade and development would apply also to the identification of feasible and promising areas for and mechanisms with which to achieve South-South cooperation. The conditions of South-South trade are different than those of North-South requiring therefore the use of different criteria. The criteria for the identification of specific sectors and the quantification of the potential for South-South trade and cooperation in each such sector that were suggested in a recent book by Yeats were reviewed but found unsatisfactory. In section B several alternative criteria for development via South-South cooperation were suggested.

First instead of insisting on labour-intensity, i.e., the intensive employment of factors that are plentiful in supply, the alternative factor-intensity criterion suggests that the industry should be intensive in factors which, although scarce in certain countries or even regions of the South, are available in at least one country or region of the South. In other words South-South cooperation should concentrate in those sectors or activities which require diversity or complementarity in resource endowments so as to require cooperation among countries of the South in order to take advantage of resource complementarity in the South as a whole.

Second, more emphasis is given in the alternative criteria to dynamic factors such as the avoidance of sectors characterized by a high rate of new product development since such developing countries are deemed unlikely to have the institutional framework and R and D capability necessary to remain competitive with the North in such industries. On the other hand, it is suggested that evidence of potential for success should be provided, for example in the form of above-average growth rates during the recent past of production in the South and of exports from the South to the South.

Likewise, it is suggested that South-South cooperation should concentrate on those industries characterized by learning-by-doing benefits and by rising importance in world trade and production. The latter criterion is justified by the fact that it should make it easier for new Southern producers to enter such industries, and the former by the fact that it can justify production in the South even prior to its being financially profitable (in the short run sense).

These criteria were applied globally and in broad terms in Section B and then in more detail in Sections C and D. The sector most clearly justified by the suggested criteria for development via South-South cooperation is the capital goods sector. Virtually all categories of capital goods, with the possible exceptions of scientific apparatus and personal automobiles, in which the rate of new product development may be excessive, would seem laden with potential for South-South cooperation. Because this suggestion flies in the face of considerable conventional wisdom against Southern entry and trade in capital goods, the arguments for and against capital goods were discussed in some detail in Section C.

Other sectors with potential for development via South-South cooperation identified on the basis of the aforementioned criteria are the following ten industries: paper, industrial chemicals, other chemicals, glass, non-metallic minerals, non-ferrous metals, metal products, petroleum refining, petroleum products and rubber. Since the last three of these are likely to require also some degree of North-South cooperation to be successful, emphasis in Section D was given to the first seven of these industries.

Given the extremely low shares of the South in world production and exports of capital goods and the aforementioned subsectors of basic products and light industry, the maintenance of the growth rates attained by the South in the recent past should be possible in a framework of South-South cooperation, even if North-South cooperation remains at an impasse.

Given the limitations of the present study, suggestions for future research include the following:

(1) the identification of the most appropriate institutional mechanisms for South-South cooperation;

(2) quantification of the extent to which South-South cooperation could raise the overall growth rates in the South and the North and the degree of attainment of the Lima targets;

(3) the degree to which the results of item (2) would be affected by North-South cooperation and other relevant policy and other variables.[1/]

1/ For a study going a long way to the achievement of such objectives, see UNIDO, The Global Report, forthcoming.

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